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BRIEFLY TOLD.

OUR CURRENT ASSOCIATION PROCEEDINGS BUDGET.—In this week's issue we continue our limited abstract of the proceedings of the Denver convention of the American Gas Light Association, and its chapters give quite a recounting of much that is of interest to gas makers from a technical point of view. Notably is this true in respect of the short topic, having the title "The Removal of Tar from Water Gas," which was prepared by Mr. W. C. Morris, who is on the engineering staff of the New Amsterdam Gas Company, of New York, the plant of which concern, however, is located in Ravenswood, a place (on the East side of the East river) not far from what was known as Long Island city. The New Amsterdam Company supplies much gas in New York city proper, through pipes in a tunnel laid under the bed of the East river. Considering the peculiar conditions governing the New Amsterdam Company's distribution, it is of course important that the water gas (which it manufactures exclusively), sent over and under by it should be as "dry" as possible, so it is fair to presume that the task undertaken by Mr. Morris needed quite a lot of study. That the gentleman studied goes without declaring, as a casual reading of his presentation will amply prove. It is a pity, however, that he was not present personally at the meeting (the topic was read by Mr. Alten S. Miller), for then he could have taken a positive part in the discussion, especially where the matter of the frequency or infrequency of changing the "spruce planer chips" was concerned, to say nothing of the various doubts as to how the chips should be placed. One thing the Morris short topic plainly proved is that tar may be considered a sort of disturber, even in the production of water gas. Following the Morris topic came another one, the preparer of which was Mr. Frank W. Frueauff, Secretary of the Denver Gas and Electric Company, whose paragraphs were devoted to a consideration of "Gas Advertising." Mr. Frueauff is a new man in the Association, but that which he had to say was sufficiently attractive to arouse a good discussion. In a straightforward way he detailed what his Company had been doing in that line, and it is absolutely certain from his recital that that which it had done had not been done in vain, so far as increased output was concerned. As was said the discussion was a good one, and those who participated in it clearly brought out the fact that different methods must obtain in different places, in respect of gas advertising as in other lines of trading. Speaking for ourselves we have no hesitancy in declaring that advertising in the gas business is an absolute necessity, and that to be most effective it must be done persistently and systematically. But as the ways of advertising are numerous and not hard to learn, it is after all simple to hit upon the plan that will best suit the particular locality, and the gas company office manager who cannot succeed in this respect, if the proprietors of his company have the slightest motive of liberality about them, should speedily make up his mind that he is not the right man in the right place. Selling rates are going down and prices of materials that enter into gas production are going up so the maintenance of the forward march in the instance of output lies along lines connected with the greater use of gas in the heating and power field. That such uses may be shown entertainingly and profitably to the consumer seem now to depend largely on the intelligent direction of the office division of a gas works concern. The

average gas engineer has kept full pace with the manufacturing difficulties that have confronted him, and it may be taken for granted that he will have the gas for sale, in no matter what the quantity that may be demanded by the office force. It is in the latter direction that the burden of profit making seems now to be.

A CORRESPONDENT'S VIEWS ON THE EDUCATIONAL FUND PRACTICE AND SCHEME.—"H.," writing to the JOURNAL under date of the 8th inst., says: "I read with much interest, in the JOURNAL for last Monday, the 'Report of the Trustees of the Gas Educational Fund to the American Gas Light Association and Other Subscribers to the Fund,' and having read it the thought will not down that it is a pity the scheme should not be elaborated so as to obtain for it official recognition by the Gas Companies. Could the matter not be managed so that the employers might be induced to give the preference to men who had certificates from the Educational Class Directors? Of course, the contributions which support the plan and scheme are voluntary, and the suggestion 'benefitismus' is upon the work; to some extent it is benevolent. It would be a positive gain if the profession at large would take hold and help this wise endeavor, even if they insisted on 'say' as the price of their aid. Possibly the school might be made self-supporting. Suppose the Committee issued a sort of testamur declaring that 'A' was educationally fit for certain work, and that the gas works' manager made it a point to have the man with the certificate rather than the man without it! Would not this be a direct gain and a large one? We all know that nothing could improve the will of the men who have the matter in charge, but the success of a teaching experiment largely depends on the work, not of the managers, but of those in direct contact with the pupils. It is always a question of the perfection of the teacher and the method of teaching when pupils fail to pass examinations, or become discouraged."

A SWINDLER.—The issue of the Philadelphia *North American* for the 2d inst. contains an exposure of the doings of a chap named Charles J. Francois, of Boston, who thought he had, by means of forging the name of Mr. George G. Ramsdell, General Manager of the American Gas Company, of Philadelphia, secured the commission on a sale of $115,000 of goods by the Boston Bridge Company to the American Gas Company. The fellow is a draughtsman, and had been employed at one time by the American Gas Company to complete an emergency job of draughting.

NOTES.—At the annual meeting of the Consumers Gas Company, of Toronto, Canada, the officers elected were: A.W. Austin, J. L. Blaikie, Henry Cawthra, G. R. R. Cockburn, Isaac C. Gilmor, George Gooderham, James Henderson, Thos. Long, Larratt W. Smith, Frank Smith, A. J. Somerville and Thos. R. Wood; President, Larratt W. Smith; Vice President, Frank Smith; Secretary and General Manager, W. H. Pearson. The gain in sendout for the year was well over 7 per cent. Important works' betterments are underway that will enable the Company to meet any demand on its manufacturing resources for the next 10 years. The total output for the year was well in excess of 835,000,000 cubic feet. The Company has 26,982 meters in use.——The Board of Supervisors of San Francisco, Cal., has rejected the petition to declare the Baldwin Gas Works a nuisance.——Mr. H. H. Stephens, General Manager of the Macomb (Ills.) Electric Light and Gas Company, informs us that, acting with others, he has secured a franchise for the operation of a gas plant in Brookfield, Mo. Brookfield is General Division Headquarters for the Missouri lines of the Chicago, Burlington and Quincy Railroad, and has a population exceeding 6,000. They propose to begin construction work early next spring, and are ready to receive estimates for a plant up to a capacity of 50,000 cubic feet per day. Under the franchise the Company bonds itself to supply gas for illuminating use at $1.50 per 1,000 cubic feet, the charge for a fuel supply not to exceed $1.25 per 1,000.——The Detroit Gas Company's semi-annual dividend of 2½ per cent. is payable the 15th inst.——Mr. J. B. Grimwood, of San Francisco, the clever Secretary of the Pacific Coast Gas Association, has returned from his trip abroad, which trip had for its leading feature, attendance at the International Gas Congress, Mr. Grimwood there officially representing the Pacific Coast Association. He enjoyed his touring time immensely, and one result thereof will likely be a lively presentation at the next Coast meeting of the leading features of some of the prominent gas works of the continent.——The St. Paul (Minn.) Gas Company has declared a dividend of 1 per cent., payable the 15th inst.——The proposed opposition for New Orleans, La., does not seem to go ahead, although General Badger and his fellow badgerers declare that New Orleans "must and shall have cheaper gas," even though capital is sunk in the original sortie.

[LIMITED ABSTRACT.—CONTINUED FROM PAGE 726.]

PROCEEDINGS, TWENTY-EIGHTH ANNUAL MEETING, AMERICAN GAS LIGHT ASSOCIATION.

HELD AT BROWN PALACE HOTEL, DENVER, COL., COMMENCING OCT. 17TH, 1900.

FIRST DAY, OCTOBER 17, 1900.

Appendices to the Report of the Research Committee.—Continued.

The statement by Mr. Norris, respecting "The Harcourt 10-Candle Power Pentane Lamp," was followed by the second appendix on

THE EDGERTON STANDARD,

which was read as follows, by Mr. Alten S. Miller, of New York:

SOME TESTS OF THE EDGERTON STANDARD.

At the last meeting of this Association the question of determining a satisfactory working standard was referred to your Research Committee. As Mr. Norris had arranged to continue tests of the Harcourt Standard, it was determined to confine these experiments to the Edgerton.

The work was done by Messrs. W. C. Morris, M.E., and Howard Bruce, C.E., which is of two kinds. Tables A, B, C and D show the averages of a number of comparisons made between Edgerton standards. One burner is kept steady in each case and the other moved as described.

Table E gives every individual test of the working standard used in the photometer room, between September 18th, 1899, and October 1st, 1900. Those values of the standard which are enclosed by the brackets should be the same. The variations are probably due more to the candles than to the burner.

TABLE A.—RESULTS OF TESTS TO DETERMINE THE DIFFERENCE IN INTENSITY OF VARIOUS PORTIONS OF THE SUGG "D" FLAME WHEN USED AS A PHOTOMETRIC STANDARD WITH THE EDGERTON SHIELD.

Standard vs. Standard Burner No. 1 to No. 5.

*No. 1 vs. No. 2 No. 1, Rotated. Position.	No. 2. vs. No. 1. No. 2. Rotated.	No. 3 vs. No. 1. No. 3, Rotated.	No. 4 vs. No. 1. No. 4, Rotated.	No. 5 vs. No. 1. No. 5, Rotated.
A..1.116	1.122	1.115	1.117	1.127
B..1.217	1.107	1.052	1.107	1.150
C..1.183	1.138	1.140	1.110	1.127
D..1.210	1.171	1.140	1.090	1.150
E..1.139	1.162	1.090	1.107	....
F..1.141	....	....	....	....

*In each case the chimney was kept in one position in reference to the bar, the burner alone being rotated.

Minimum Value.

1.116	1.107	1.052	1.090	1.127

Maximum Value.

1.217	1.171	1.140	1.117	1.150

Extreme Difference.

.101	.064	.088	.027	.023

Per Cent. Variation from Minimum Value.

$$\frac{(1.)\ .101\times 100}{1.116}=9\ 05\text{ pr. ct.}\qquad \frac{(2.)\ .064\times 100}{1.107}=5.78\text{ pr. ct.}\qquad \frac{(3.)\ .088\times 100}{1.052}=8.37\text{ pr. ct.}$$

$$\frac{(4.)\ .027\times 100}{1.090}=2.48\text{ pr. ct.}\qquad \frac{(5.)\ .023\times 100}{1.127}=2.04\text{ pr. ct.}$$

TABLE B.—RESULTS OF TESTS TO DETERMINE ERRORS THAT MAY OCCUR, DUE TO VARIATION OF CHIMNEY AND SHIELD, FROM THE POSITION THAT THEY WERE IN WHEN BURNER WAS STANDARDIZED. —Due to change of position of chimney with respect to center of burner, greatest eccentricity being about ⅛ inch.

A 1.120..... ○ original position.
B 1.126.....
C 1.124.....
D 1.122.....

Minimum value	1.120
Maximum value	1.126
Original value	1.120
Extreme variation from original value	.006
Percentage variation $\frac{.006\times 100}{1.120}$	.53

TABLE C.—VARIATION CAUSED BY DIFFERENT POSITION OF THE CHIMNEY.—Burner kept steady and chimney rotated around vertical axis.

A 1.120 ... Minimum value..... ..... 1.120
B 1.134:... Maximum value..... 1.144
C 1.144.... Extreme variation..... .024

Percentage variation $\frac{.024 \times 100}{1.120}$ 2.14

TABLE D.—VARIATION DUE TO RAISING AND LOWERING FLAME ½ INCH ABOVE AND BELOW CORRECT POSITION.

Position.		
Correct position	1.122	
Flame high....	1.138..	Minimum value..... 1.116
Flame low.....	1.116..	Maximum value..... 1.138
		Greatest variation from original position .016

Percentage variation $\frac{.016 \times 100}{1.122}$ 1.43

TABLE E.—TEST OF SUGG "D" ARGAND BURNER.

Burner "A."

Number.	Date.	Value.	Remarks.
1	9.18.99	6.42	
2	9.23.99	6.42	
3	10.17.99	6 37	
4	10.27.99	6 35	
5	11. 9.99	6.29	
6	11. 9.99	6.29	Chimney not clean.
7	11.13.99	6.28	
8	11.18.99	6.38	Chimney cleaned.
9	11.20.99	6.15	
10	11.23.99	6.24	New chimney put on and burner rotated slightly.
11	11.28.99	6.21	
12	11.28.99	6.25	
13	12. 1.99	5.92	
14	12. 1.99	5.99	Burner cleaned—new chimney.
15	12. 2.99	6.02	
16	12. 3.99	5.98	
17	12. 4.99	6.06	New chimney. Burner rotated.
19	12. 8.99	5.78	Burner rotated.
20	12. 8.99	5.75	
21	12.14.99	5.97	
22	12.14.99	6.01	Burner cleaned.
23	12.17.99	6.07	
24	12.23.99	5.99	

New Burner "B."

25	12.28.99	5.54	
26	12.29.99	5.53	
27	1.11.00	5.55	
28	1.16.00	5.53	
29	1.19.00	5.99	
30	1.19.00	6.03	
31	1.20.00	5.96	
32	1.20.00	6.04	Chimney cleaned, burner rotated slightly.
33	1.27.00	5.92	
34	1.27.00	6.01	
35	1.30.00	6.00	
36	2. 4.00	6.11	
37	2. 4.00	6.14	
38	2. 9.00	6.13	Burner rotated.
39	3. 1.00	6.16	
40	3. 1.00	6.16	
41	4.24.00	6.12	Burner rotated.
42	5. 2.00	6.11	
43	5.17.00	5.76	
44	5.17.00	5.68	Chimney cleaned and burner rotated.
45	5.17.00	5.68	
46	5.22.00	5.82	
47	5.22.00	5.82	
48	5.30.00	5.77	
49	6. 6.00	6.31	New burner, chimney shifted.

New Burner "C."

50	6. 9.00	6.00	
51	6.16.00	5.96	
52	6.21.00	6.17	
53	6.28.00	6.16	
54	7.10.00	6.17	
55	8.16.00	6.00	New burner "D."
56	8.17.90	6.44	Burner "C."
57	9.11.00	6.33	Chimney cleaned, burner rotated.
58	9.20.00	5.95	Burner rotated, new chimney.
59	9.20.00	6.03	
60	9.23.00	5.94	
61	9.23.00	5.91	
62	9.29.00	6.01	
63	9.29.00	6.02	
64	9.30.00	5.97	
65	9.30.00	6.03	Burner rotated, new chimney.
66	10. 1.00	6.00	
67	10. 1.00	6.66	

Note.—In every case these figures which should be the same are bracketed together.

SUMMATION.

Burner "A," "B" and "C."		Max. var. for set of values taken under same conditions.	Max. var. for different positions of same burner.
1-2 3 4 & 8,	should be the same	1.1 per cent	
5 6 & 7,	" " " "	1. "	
9-10-11 & 12,	" " " "	1.8 "	A 1.2 per cent.
13-14-15 & 16,	" " " "	1.7 "	
18 & 20,	" " " "	.5 "	
21-22 23 & 24,	" " " "	1.7 "	
25-26-27 & 28,	" " " "	.4 "	
29 30 31-32-33-34 & 35,	" " " "	1.9 "	
36-37-38 39 & 40,	" " " "	.8 "	B 1.4 "
41 & 42,	" " " "	.2 "	
43-44-45-46-47 & 48,	" " " "	2.5 "	
50 & 51,	" " " "	.7 "	
52-53 & 54,	" " " "	.2 "	C 9 "
58-59-60 61-62-63 64-65 66 & 67	" "	2.5 "	

The extreme variation shown in Table A is 9.05 per cent.; that in B, .53 per cent; in C, 2.14 per cent; and in D, 1.43 per cent.

The extreme variation of tests in Table E that should be alike is 2.5 per cent. while the maximum value of the burner that varied most is 14 per cent., above its minimum value. These tests would seem to indicate that the Edgerton Standard is highly satisfactory, provided it is not touched after being tested. If it is disturbed in the slightest degree after being tested, a new test should be made.

Discussion.

The discussion on the appendices was opened by Mr. E. C. Jones, who described a standard prepared by him for measuring the efficiency of the incandescent lamps used by his Company. It was an arrangement for burning acetylene. The description shows that it is possible to find some practical and not extra dangerous employment for this peculiar gas. Mr. Jones seems to be much pleased with his experiment, but it is doubtful if acetylene will be generally useful even on the line indicated. He also drew attention to the small influence which Mr. Norris credits to the barometric change. He asked if he understood correctly "that 1¼ inches of mercury, or ¼ of an atmosphere, would not affect the candle power," and Mr. Norris said that if there was any change it was within the invisible error. No attention was given to the fact that 1¼ inches is not ¼ of an atmosphere, but only $\frac{1}{15}$. Mr. Jones further said that the variation in mantles produced by unskillful handling was far more serious than any possible change in the quality of the gas.

Mr. A. C. Humphreys said the appendices showed how important was the change in the feeling of the profession towards the photometer. There was need, he thought, for more such papers.

Mr. Roberts seemed to find great satisfaction in the good showing for the slit.

Mr. A. S. Miller regarded the present as a remarkable showing for the candle. In fact the papers showed especially the superiority of the candle as a standard. The demand for superior standards was an endeavor to substitute perfect machines for imperfect men.

The President closed the discussion formally, and then appointed Dr. E. G. Love as the American member of the "Committee Charged with the Task of Devising an International Standard for Measuring the Candle Power of Incandescent Gas Lights."

COMMITTEE TO AWARD THE BEAL MEDAL.

The President appointed Messrs. A. C. Humphreys, W. H. White and Emerson McMillin a committee to award the Beal Medal, which medal is given annually to the writer of the best paper presented to the meeting.

The Secretary then read the following

SUPPLEMENTARY REPORT FROM THE RESEARCH COMMITTEE:

As the Research Committee has not succeeded as yet in persuading anyone to take up and experiment upon the subject of the proper point at which coal gas and carburretted water gas should be mixed in a combined works, in order to secure the largest yield of gas of the highest candle power possible from a given quantity of materials, it has been thought well to treat the subject from a theoretical standpoint, in the hope that such treatment may form a basis upon which some of the members of the Association can found practical experiments. There must be some one point at which the mixing should take place,

to obtain the best results; and an appreciable gain in candle power would no doubt follow the determination of this point by careful experiment.

The practically universal custom is to mix the two gases after both have been condensed. On theoretical grounds this does not seem to be wise. The heavy hydrocarbons in the two kinds of gas are not identical, especially if the coal gas be the result of high temperature distillation, and the carburretted water gas be made with a superheater temperature adjusted to avoid the production of naphthaline. Under these conditions, which are those commonly found, the heavy hydrocarbons of the coal gas will belong principally to the benzole series, while those of the water gas will be largely olefines and paraffines.

A gas saturated or nearly saturated with hydrocarbons of one series can take up and hold those of the other series without interference. It is well known that during the condensation of an illuminating ga , especially if it takes place abruptly, some hydrocarbon vapors are condensed before their points of saturation are reached, owing to the action upon them of the heavier vapors which have arrived at the condition of saturation. The farther the vapors are removed from this point the less probable is it that such action will occur.

Since the vapors in the coal gas and those in the carburretted water gas belong to a great extent to different series, almost all the vapors in the mixture, formed by mixing the two gases before either is condensed, will be farther from the point of saturation than would be the case with either gas singly, and would, therefore, be more apt to stay in the gas during condensation. The finished gas would thus possess a larger percentage of illuminating vapors than it would when each gas is condensed by itself. As the heavy tar of either gas might exert a harmful solvent action upon the hydrocarbons in the other gas, this tar should be removed in each case before the gases are mixed, by means of a friction condenser, the temperature of the gas being maintained during the operation.

This same result would be obtained in a lesser degree by taking one gas after the operation of condensation had been completed and mixing it with the other while the latter was still hot.

There is no question that from the candle power standpoint the plan of mixing the gases cold is wrong, and that the cost of the experiments required to discover the proper point of mixture would be fully repaid by improved results.

Discussion.

Mr. Norris announced his satisfaction over knowing that his work would be continued by volunteers, and stated that recruits would be welcome at any time.

The President then introduced Mr. A. H. Barret, Chief Engineer of the Louisville (Ky.) Gas Company, who read his paper on

INCLINED RETORTS.

[For Mr. Barret's paper, see JOURNAL Nov. 5, 1900, p. 726]

Discussion.

The exchange of thought between Messrs. Dunbar, Forstall and Barret brought out the fact that Mr. Barret was satisfied the yield of tar per ton of coal was less than it had been in the Louisville works when horizontal retorts were used. Where it had gone he did not intend to guess, and had not ascertained, nor was he prepared to give amounts. He only stated the facts as he found them. He had no facts in regard to density of coke as he used only small coal.

Mr. Norris stated that abroad they had found some falling off in candle power from sloping retorts. About that Mr. Barret was silent, but he declared he had found no difference, nor had he found any difference in the average frequency of stopped pipes.

Mr. Strecker inquired for the influence on wages. Mr. Barret stated these were the same per man, but the men were not pushed so hard.

Mr. Egner then drew attention to the great change in the feeling in regard to the matter under discussion, and complimented Mr. Barret on his paper and on his professional work, giving a sketch of the advance of the question from the beginning. Mr. Barret then drew attention to the fact that the length of retort had not been mentioned in the discussion; but in answer to the statement in the President's paper he would say that it was a question of coal, and this only.

The crushing of the coal then came up for discussion, and Mr. Barret gave the ¾-inch screen as the standard.

Mr. Egner said England ranged to very long retorts, while Germany favored shorter ones. He also believed the coal should be dry.

Mr. Forstall said that the development of water gas had been in this country and that of coal gas in England, whereas now an exchange was being made.

Mr. Forstall also noted the fact that gravity aids in handling charges in inclined retorts and that its action is constant.

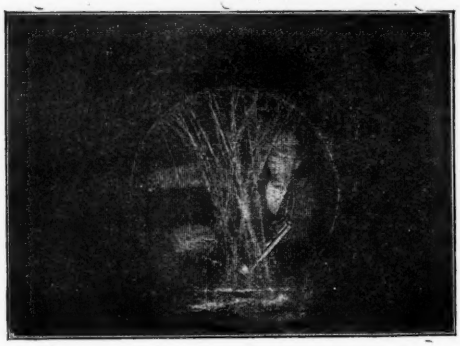
Mr. Beal considered the idea of Mr. Barret, that one man could produce 100,000 cubic feet a day, as important in the extreme, considering the simplicity of the machines.

Mr. Littlehales said it was important to remember that the original suggestion over inclined retorts came from Montreal, Canada, and that he was associated in the initial work. It was the very first attempt.

After a vote of thanks had been passed to Mr. Barret, the Secretary read the following "Short Topic," prepared by Mr. William Nichols Tolman, of Philadelphia, on

THE REPAIR OF A BROKEN 36-INCH OUTLET PIPE FROM A GASHOLDER.

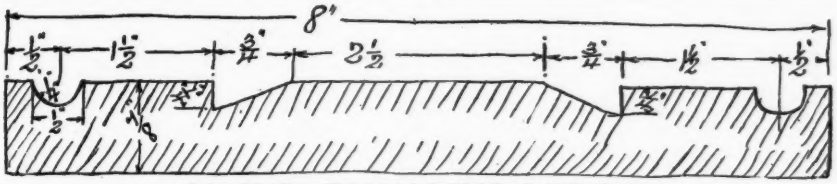
Early in the spring of 1900 a leak was discovered in the 36-inch outlet of No. 2 holder, Station B, of the Philadelphia gas works. The tank of this holder is of masonry, 36 feet deep, with the ground water standing 19 feet below the coping of the tank. The leak was so serious that it was decided to put the holder out of use and examine and repair the pipe from within. This examination showed that all the joints in the horizontal run beneath the tank wall were leaking. This horizontal line of pipe is 22 feet long, and has three joints; that at the drip-pot of lead, the other two, flange joints, being made up without gaskets. The lead joint was fortunately a little open, and it was possible to stop this leak by caulking it from within the pipe with cold lead. Small grooves were cut in the two flange joints with cold chisels and a soft wire driven into these grooves. The leak in one joint had been successfully closed by this method, and the work on the second was all but completed when a small crack, 4 inches long, was discovered in the top of the pipe, about 2 inches from the joint and running parallel to it.



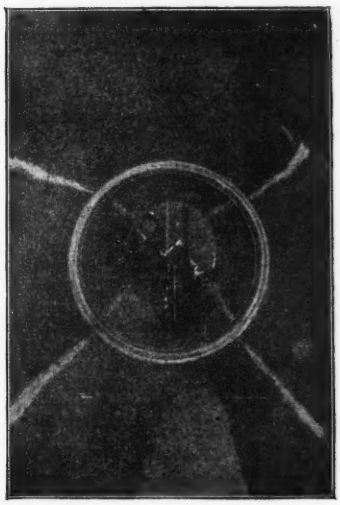
Leak in 36-inch Pipe After the Pipe Had Been Filled to Cause Settlement.

This joint was the middle one, directly beneath the tank wall. The pipe at this point is imbedded in the solid masonry of the wall. The crack was very small and could be discovered only by a close examination, but it steadily increased in length so that seven days later it extended about one quarter way around the pipe. The width had increased also, and the leakage into the pipe was 78 gallons in 24 hours. Levels on the pipe showed that the vertical run of pipe outside the holder had settled. As it was impossible to strengthen the foundation, or to wait for the pipe to sink to a solid foundation, it was decided to fill the pipe with water and cause at once as much settlement as possible. The pipe was accordingly filled and kept full for one week. The water was then pumped out and the pipe again examined. The crack now ran across the upper half of the pipe. Its course was quite straight, meeting the joint at the sides of the pipe, and being but 4 inches away at the top. At the joints the crack was small, but at the top of the pipe, for a distance of 2 feet, it was ¼ of an inch wide. The water came through with considerable force, and in great volume, requiring the constant use of a steam siphon or ejector to keep the drip-pot free from water.

The following method was adopted to repair the break: For the convenience of the workmen the crack was plugged as far as possible with soft pine. A wrought iron sleeve, 8 inches wide and 34¾ inches outside diameter, was placed inside the pipe at the crack, and centered so as to give the same width of joint all around the sleeve. The outside of this



Section of W. I. Sleeve, 34¾-Inch O. S. D., for 36-Inch Pipe, No. 2 Holder, Sta. B.



Sleeve in 36-Inch Pipe: Repair Completed. (The white lines along the pipe are chalk lines made to give perspective to the picture. The sleeve and the lead joint have also been chalked in order to bring out the detail more clearly.)

sleeve was grooved so as to hold the oakum and lead in place in case any further movement or settlement of the pipe occurred.

The joint was made up with 4 inches of tarred oakum with 2 inches of lead on either side; this brought the lead against the unbroken part of the pipe on the one side of the sleeve and on the adjoining pipe on the other. As the lead joints had to be made with cold metal, care was taken to have each piece of lead long enough to go around the sleeve. The work was completed on May 4th, the leak being completely stopped.

The holder was immediately put in use and the amount of drippage from this pipe was measured for a few weeks. As it was evident that the repair was effective, no further measurements were made, and up to the present time there have been no indications of any leakage.

Discussion.

The paper was discussed with special relation to the mechanical difficulties, Mr. A. S. Miller taking the lead. Mr. Miller seemed to think a better way could have been found for doing the needed work, and stated how he thought it should have been done.

Mr. Norris, on the contrary, defended the design. What was needed, was something practicable under the circumstance, and the result proved this was just the thing.

Mr. Knapp saw an important lesson in the paper, which seemed to be the providing of large inlet and outlet pipes, specially in bad situations. But for the large pipes, where would they have been in the instance narrated by Mr. Tolman?

The Convention was then declared adjourned, to reassemble at 10 A. M. the following day.

SECOND DAY, OCTOBER 18, 1900.

The President having called the meeting to order, Mr. A. C. Humphreys, of New York, said he thought it would be a graceful and appropriate act on the part of the Association to send to Mr. C. E. Sanderson, Manager of the AMERICAN GAS LIGHT JOURNAL, a telegram regretting alike his absence from the meeting and the cause thereof. Continuing, Mr. Humphreys said the present meeting of the Association was the first one which Mr. Sanderson had not attended, and he was sure the members would concur with him in the thought that it was fitting some mention of their feeling toward Mr. Sanderson should be officially made. A motion in accordance with the sentiment expressed by Mr. Humphreys was unanimously adopted, and the Secretary subsequently forwarded the following

TELEGRAM TO MR. SANDERSON.

DENVER, COL., Oct. 18, 1900.

C. E. SANDERSON, 239 McDonough street, Brooklyn, N. Y.: The members of the American Gas Light Association regret your first absence from its meetings in 28 years, and desire to express their sorrow over the cause of this absence and their wish for your early recovery.

ALFRED E. FORSTALL.

REPORT OF COMMITTEE ON PLACE OF NEXT MEETING.

The report of the Committee on Next Place of Meeting reported in favor of Boston, which report was adopted.

The Association then listened to the lecture on

THE THEORY OF THE INCANDESCENT LIGHT,

which lecture was eloquently delivered by Dr. E. G. Love, of New York.

[For Doctor Love's lecture, see JOURNAL, Nov. 5, 1900, Page 728.]

Following the lecture, Mr. Alten S. Miller, of New York, read the following "Short Topic," prepared by Mr. W. C. Morris, of Long Island City, N. Y., on

THE REMOVAL OF TAR FROM WATER GAS.

The title of this paper, covering the passage of the gas from the machine take-offs to the purifier outlets, includes a subject more comprehensive than can be discussed in this brief paper. The removal of tar from the gas in the wash boxes, hot scrubbers and condensers presents a field for investigation from which much of value might still be obtained. At present we will consider the removal of the tar particles in the gas after leaving the relief holder.

Prof. D. S. Jacobus, in experiments on the "Distribution of Moisture in Steam When Flowing Through a Horizontal Pipe,"[1] proved by actual observation that steam condenses only on surfaces of solids or liquids, and that it does not condense in the shape of a fog in an atmosphere that is free from dust or floating particles. All actual condensation that is carried along with the current is in the form of streams on the bottom and sides of the pipe. Assuming that the same principles prevailed in unpurified gas, scrubbers were designed to give a surface for the super-saturated vapors to condense on.

Four methods (other than draining by the use of drips) of removing tar particles suggest themselves:

1. By rapid changes of direction in the flow of gas, attended with friction, in a manner similar to a steam oil separator.

2. By condensation and absorption of the particles with a suitable material.

3. By a combination of Nos. 1 and 2.

4. By a centrifugal action.

Apparatus was devised and tested, covering Nos. 1 and 3; method No. 2 not appearing feasible without a complication of No. 1, was discarded; method No. 4, presenting difficulties not easily overcome with appliances at hand, and being in a degree covered by No. 1, was not attempted.

At the suggestion of Mr. J. M. Rusby, M.E., of Jersey City, N. J., a scrubber of the first type was constructed, consisting of a box 6 feet by 4 inches by 3 inches, containing 132 thin iron plates arranged as shown in sketch marked "Batter Scrubber," Fig. 1.

It will be seen that this arrangement causes the gas to change its direction many times in the length of the box, and subjects it to friction and battering at every turn. Gas was passed through at several speeds testing with the free edges of the plates both vertical and horizontal; the tar in the first case draining against the gas, in the second case, from between the bottom plates.

1. Transactions Am. Soc. M. E., 1895.

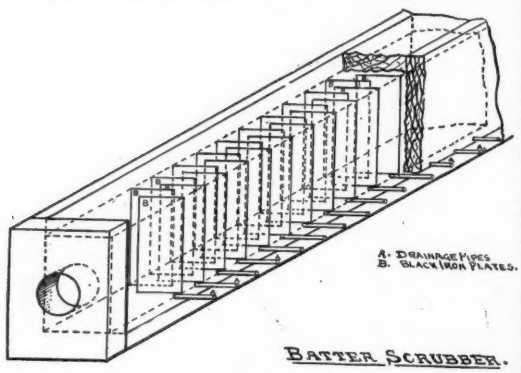


Fig. 1.

The scrubbing action was determined by the coloration upon a piece of cotton contained in a glass tube through which gas from the scrubber outlet was caused to pass by burning at the end of the tube. This device was used in all experiments to determine if tar was passing.

Tar showed at the cotton test tube as follows:

	Plates.	
	Vertical.	Horizontal.
For 600 cubic feet per hour.	10 sec's.	25–40 sec's.
" 540 " " " "	10 "	20–35 "
" 480 " " " "	— "	35 "
" 350 " " " "	5 "	10–20 "
" 240 " " " "	5 "	8–15 "

At 480 cubic feet per hour the loss of pressure was 5 inches.

A Pelouze and Audouin No. 2 condenser was next tested with varying differences of pressure. In each case tar showed at the test cotton almost as soon as the gas was turned on the apparatus.

Last, of the scrubbers, depending upon the first method of scrubbing, was one 4 feet diameter by 16 feet high, filled with wooden trays, consisting of ¾-inch bats, spaced ¾-inch, and put together so as to break joints. This was tested for velocities varying from 200 to 850 cubic feet per square foot per hour. At all velocities tar showed in a few seconds.

The first scrubber tested of those depending upon absorption, friction, and so forth, for scrubbing action, was a 10-inch pipe, 16 feet long, filled, for 15 feet, with spruce planer chips. This was set vertical and connected with a 2-inch pipe. Gas passed for 80 days with about 8 inches loss of pressure without a trace of tar showing at the outlet. The chips when examined were black for 2 feet, brown for 5 feet and oiled for the remaining 8 feet.

Next was constructed a scrubber, 6 inches in diameter and 5 feet high, containing two 18-inch layers of shavings, 6 inches apart.

Through this gas was passed at the rate of 600 cubic feet per hour (3,100 cubic feet per square foot per hour). After the scrubber had fouled, a pressure equivalent to 6½ inches of water was necessary to force the gas at the mentioned rate. The total gas passed before the test cotton colored was 30,600 cubic feet. This represented a duty of 65,000 cubic feet per bushel. The shavings, when removed, were, for 10 inches black, and for 8 inches brown on the bottom layer, and oiled throughout the top layer.

Another scrubber similar to the 10-inch by 16 foot scrubber was constructed of 6 inch pipe, 21 feet long, filled for 20 feet with shavings. This had passed 89,100 cubic feet of gas, at a rate of 2,143 cubic feet per square foot per hour, with a loss in pressure of 14½ inches when taken down, no trace of tar having appeared at test cotton. The shavings, when removed, were tarred for 2½ feet and oiled throughout the remaining height.

A number of tests were made to determine the loss in illuminating power on several of the scrubbers. The average loss of illuminating power was as follows:

Scrubber.	
Pelouze & Audouin	2.24 per cent. average loss.
10-inch by 16 feet (shavings)	2.42 " " " "
6 " " 21 " "	2.11 " " " "
Purifying boxes (oxide)	2.02 " " " "

If we take the data obtained from the 6-inch scrubber, using the two 18 inch layers of shavings as a basis of calculation, assuming a gas velocity of 100 cubic feet per square foot per hour, we find shavings would have to be replaced in 24 days.

Taking the 6-inch by 20 foot scrubber, having a shavings volume 6½ times the above, and assuming the same service (65,000 cubic feet per bushel) the time between the changes would be 152 days.

These results appeared so promising that it was thought advisable to put them to a working test. We, therefore, placed in the first box of each set of the purifiers two 24 to 26 inch layers of spruce shavings, obtaining results sufficiently satisfactory to cause the re-arrangement of the center seal connections, so that the gas would pass through one of the four boxes of each set before entering the seals.

Some difficulty was encountered by the gas passing through the shavings in spots, allowing tar to show at the outlet before full work had been obtained from the shavings. This was overcome by placing boards between the two layers and over the top layer, causing the gas to traverse the length of the box twice before exit. (Fig. 2.) The

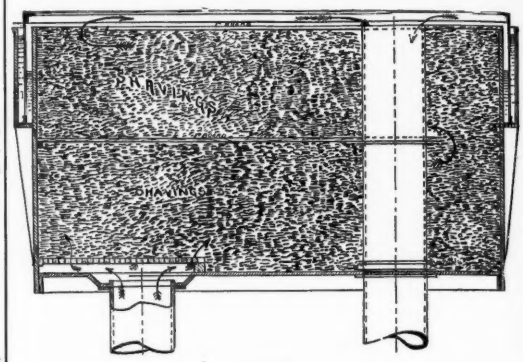


Fig. 2.

change proved entirely satisfactory, no trace of tar appearing in the oxide boxes. The duty obtained for this manner of working was 210,000 cubic feet per bushel.

The pressure necessary to pass the gas for a velocity of 1,700 cubic feet per square foot per hour was equivalent to about 13 inches of water. Demand for additional purifying capacity made it necessary to design a separate plant, consisting of six 10 feet diameter by 30 feet shells, providing for four layers 6 feet deep to each shell. In these scrubbers the shavings are supported on wooden grids, spaced 6 feet, 8 inches apart, and arranged so that dumping may be effected by the action of a lever operated from the outside by a wheel and screw.

The scrubbers are filled through a manhole, placed at the top of the shells, to which the material is elevated by a system similar to that used in planing mills to remove dust from the table, consisting of a Sturtevant exhauster and the necessary piping and air separator. The exhauster is placed on the ground inside the building, its inlet pipe extending outside the building and near the ground where the shavings are fed to it. They are then carried to any one of the separators placed above the manholes at the top of the scrubbers, and allowed to fall in succession on the grids until each is filled to the proper depth. At the bottom a dumping hopper is provided for the removal of the shavings. In operation the gas is passed up through the scrubber, the tar draining to the bottom.

The loss in pressure for 920 cubic feet per square foot per hour, after the shavings had been in use for several months, was 5 5/16 inches. The quantity of gas scrubbed per bushel for the last renewal of material was 570,000 cubic feet.

Through the courtesy of Mr. J. S. De Hart, Jr., M.E., I am able to add to the other sketches a detail of the scrubber, Fig. 3.

A scrubber of similar nature, 8 feet in diameter, was in use by Mr. I. N. Knapp, Superintendent at Omaha, in 1897, in which he used two 18 to 20-inch layers of spruce shavings. He obtained for fresh chips a loss of pressure of 1 inch, and of 3 inches after having passed 30,500,000 cubic feet for a rate of 36,000 cubic feet per hour. This scrubber has since, I believe, been abandoned.

Discussion.

In discussing the Morris short topic, Mr. Knapp said one important point in connection with the matter had not been brought out in the paper. This point referred to the moistening of the shavings before they are put in the scrubber, otherwise the heat of the gas swelled them up. If the pressure rose from accumulation of tarry matter, that was

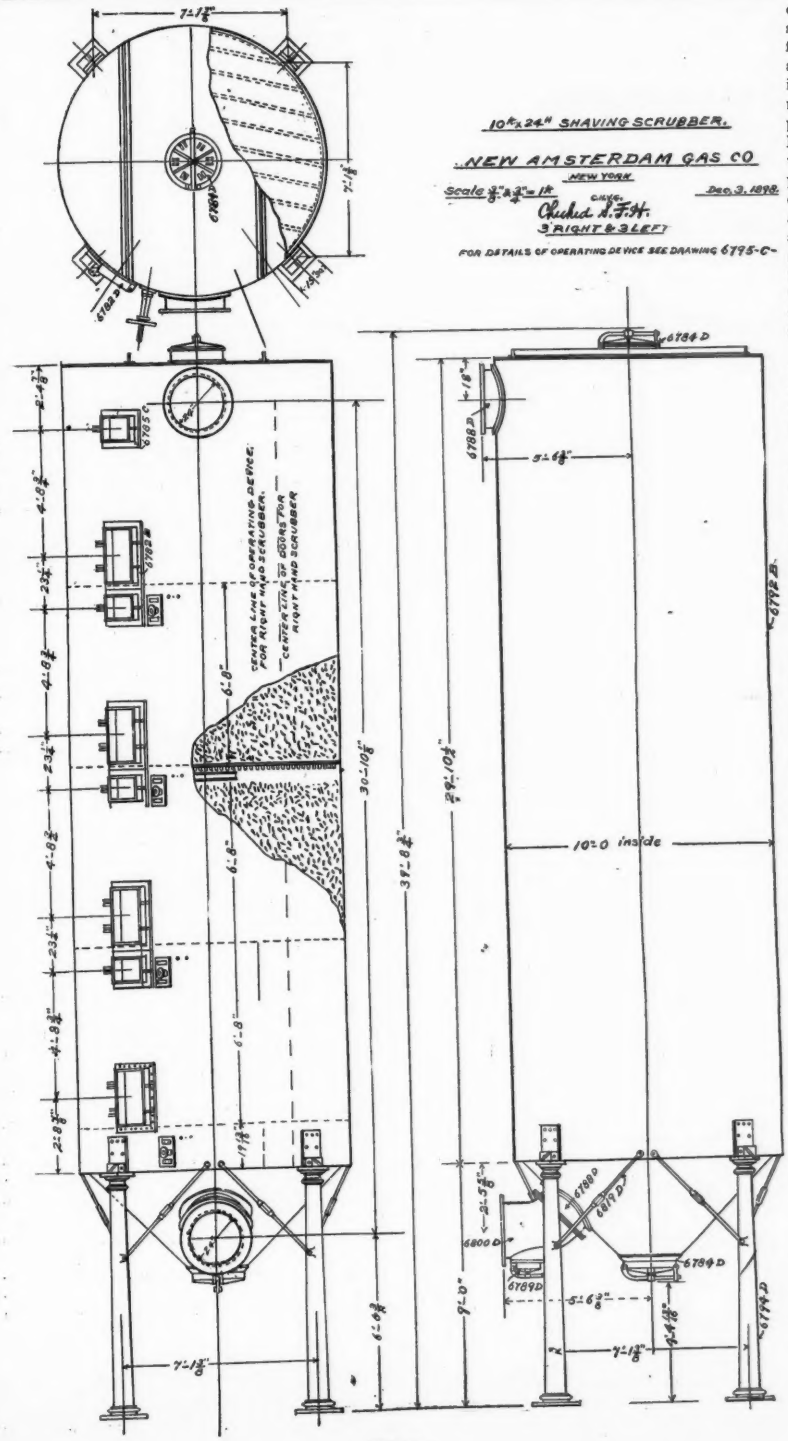

10'6"x24'0" SHAVING SCRUBBER.
NEW AMSTERDAM GAS CO
NEW YORK
Scale 3/4"=1ft
Dec. 3, 1898
Checked F.H.
3 RIGHT & 3 LEFT
FOR DETAILS OF OPERATING DEVICE SEE DRAWING 6795-C
CENTER LINE OF OPERATING DEVICE FOR RIGHT HAND SCRUBBER.
CENTER LINE OF DOORS FOR RIGHT HAND SCRUBBER
10'-0 inside

Fig. 3.

easily gotten rid of by turning the steam from the exhauster into the flow of gas. Under the practice at the works where Mr. Knapp is engaged conditions such as those named by Mr. Morris are quite impossible. Mr. Morris spoke of 6 feet layers of shavings, but 36 inches was the limit of Mr. Knapp's experience. At first Mr. Knapp changed the shavings quite often, and he connected the photometer so as to get a reading from both sides of the bed of shavings, but he found it was not needful to change the shavings so frequently, as they could be cleaned with exhaust steam.

Mr. Norris said that the abandoning of the scrubbers was not due to their failure, but to the change in the works by which the scrubbers were made unnecessary.

Mr. Forstall wanted to know what the change was which made the scrubbers needless. Mr. Norris said he might have thought of that. The new Omaha (Neb.) plant had such large purifiers that the layer of shavings in the boxes does away with special apparatus. The time might come when scrubbers would be needed, but not yet.

Mr. Young did not seem to like the plan of putting the shavings in the box, because of the tendency to mix.

Mr. Norris said the materials were in separate trays, the oxide being dumped through the shavings layer. It is not needful to renew the shavings until they have had several turns.

Mr. Knapp then gave an account of the conditions at the old Omaha works, and said that Mr. Norris was mistaken in regard to the situation at Omaha, and that the real trouble is in the bad management of the superheater. Mr. Knapp drew attention to one important fact: "It is a very easy matter for anybody to run the heat up in the superheater; to keep it down, that is the trouble." Mr. Miller could not agree with Mr. Norris.

The "short topic," by Mr. F. W. Frueauff, of Denver, Col., entitled

GAS ADVERTISING,

was then taken up, as follows:

Until the coming to Denver, Col., of the late Mr. Geo. T. Thompson, gas advertising as a factor for the growth and development of the gas business was unknown here. Previous to that time all advertising had been done, "on demand," simply to aid some worthy charity, or to fill space at the request of some publication. No permanent benefit was sought or expected by these expenditures, and, lacking as

they did the all necessary principle of persistence, no results can be traced to them.

Mr. Thompson came to Denver thoroughly posted on the most successful methods of gas advertising, and under his direction a plan of campaign was mapped out for the season of 1899. Denver people knew almost nothing of the advantages of gas for fuel, and to enlighten them in this direction almost all our efforts in advertising were directed.

The Company adopted the plan of selling gas ranges at cost, making connections free, and donating to the purchaser of each range 5,000 cubic feet of gas. To acquaint the public with the proposition, contracts were made with all of the four daily papers providing for "ads." of at least one square each day.

That the ads. might easily catch the eyes of the reader, the plan was suggested of using a large script print, which was entirely different from any other advertisement in the paper. This style was adhered to through the summer, and, as proof of its merit, several advertisers are using this style. Rough sketches, illustrating the advantages of gas ranges, and the awful disasters attending the use of coal, kindling and stove pipes were inserted from time to time, and short, pithy sentences, bringing out forcibly some particular feature of fuel gas, were used. The ads. were changed every week or two, and so arranged that the two morning papers and the two evening papers showed different copy

Another plan to bring gas for fuel to the notice of the housewives was through a printed pamphlet, entitled, "Denver ladies do some talking." This was compiled from replies received in answer to personal letters sent to various ladies who were using gas ranges, asking for their opinion of this method of cooking. The interiors of several Denver kitchens were also shown, together with small cuts taken from other pamphlets. This made a very artistic and attractive booklet, and Mr. Thompson received many letters from gas men complimenting him on the excellence of this work. Copies of this pamphlet were delivered to all consumers in envelopes directed to them. Quantities were also placed at convenient places in the office, where the public might see and take one. Mention was also made of the work through the ads. in the daily papers. This method we found brought a great many to the office to investigate, and was the cause of much talk and inquiry back and forth among the ladies.

To practically demonstrate the use of gas for cooking, we gave one exhibition at a free, pure food show, held in the early summer. Biscuits were cooked and passed to the crowd. Proper care was taken to enlighten the onlookers as to the method used, but it must be added that little good resulted from feeding the thousands.

The bill boards here are thought by some to be one of Denver's greatest features. They are found on every vacant corner, surrounding every abandoned building, and fronting empty lots. Passing on the cars one can easily imagine himself turning the advertising pages of a magazine. We contracted with the bill posters to erect and maintain for three months a number of large posters on corners where cars were constantly passing. We used a cut, highly colored, showing a woman at a gas range, with suitable reading matter, and directing people to the Company's office. This was a comparatively inexpensive method, the entire cost being but $2.50 per month each. The constant increase in the number of posters placed throughout the city, and the elaborateness of many of them, indicate that they are a profitable method of advertising. Two other methods of printed advertising were tried. Space was secured on the delivery tickets of two large grocery houses, on which a suitable advertisement was inserted. These tickets were being left constantly throughout all parts of the city, and were bound to catch the eye of the housewife when receiving her purchases.

A musical publishing house, anxious to establish itself, distributed large quantities of popular music, the expense of it being borne by the advertisers. The top margin of the front page carried our ad. for fuel gas, in the script style already mentioned.

The "Marian Harland Cook Book" was another plan used; a quantity was purchased having the Company name on the front cover, and containing advertising matter along with the recipes. Advertisements through the daily papers, stating that these would be presented on application, brought a great many people to the stove department, who usually stopped to look, examine and possibly invest in a range before leaving. We are sending with all ranges a copy of this book, and are constantly having calls for them.

Not the least advertising done in 1899 was the establishing of branch agencies for payment of bills in drug stores throughout the city. These agents are constantly answering questions regarding the business, and bear witness to the growing interest of the public in our efforts to advance fuel gas.

The campaign of 1899 ended as satisfactorily in results as had been expected, and while a number of plans of advertising were used, there are others yet to be tried.

For 1900 all efforts at newspaper advertising were abandoned, and a systematic house-to-house canvass was inaugurated. The city was divided into districts and men assigned to them. Every housholder on the main was visited, and record made of their call. Some orders were secured at the houses, but most of the purchasers preferred to call at the office and select their stove from the stock on exhibition. If it was found that the party visited had a range, she was induced to talk about it, and her opinion was carried to her neighbors in the block with very good results. Many people had to be visited several times before they developed any great interest in the work.

Some people were found who expressed a desire for a range, but could not afford to pay much for it. To supply their wants a cheaper line of ranges was used, being sold them on monthly payments of $1 per month. This was advertised by means of printed matter on the monthly bills, and placards in the office windows, and by small handbills left by the solicitors with their card.

The plans used in 1900 showed more substantial results, the sale of ranges being as 3 to 1 compared with the previous year. It is but fair to add that much of this increase is due to the work of the previous year in familiarizing people with fuel gas.

Discussion.

The questions in this topic were of great interest to the members. Mr. F. D. Moses went into the matter thoroughly, giving details of how he sold stoves in Trenton, N. J., and other places. He wanted it distinctly understood that they sold the stoves in order to increase the sales of gas, not to build up a trade in stoves.

Mr. H. L Doherty, among other interesting matter, said that he thought the mistake among gas men had always been that they were in too big a hurry for returns.

Mr. Pratt then described the "Ladies' Luncheon," managed by their Company at Des Moines, Iowa, also the classes of instruction for the servants. He also stated his belief that the gas company should look prosperous, and teams are a good way of showing it.

Mr. Miller having stated his plan, Mr. Littlehales said that in his judgment the use of every method was the proper plan, but the house-to-house canvass was absolutely needful; it must not be omitted.

Mr. Jenkins also advised the house-to-house canvass. The canvasser sells to the people who have the want ready made; the newspaper ads. making the want.

The description of a widely extended scheme of advertising then followed, and finally a motion was made that the American Gas Light Association officially assist in the effort now going on in other Associations to establish a National Advertising Bureau.

Mr. A. C. Humphreys brought out plainly the really marvellous result which had been reached at Trenton, N. J., and advised the employment of proper talent for the purpose of advertising. Mr. Paul Doty insisted that advertising often stood for education, and said, "the lady demonstrator at the office is an educator." The Wanamaker style also has its uses.

Mr. Kellogg formulated his plan, after which Mr. E. C. Jones detailed the plans followed by the San Francisco Company. Its receptions and other procedures were described.

Mr. Forstall then described the Collins method of advertising: "If you love your wife buy her a gas stove." Mr. Doherty then described his plan in detail.

Mr. E. G. Cowdery, of Milwaukee, mentioned his scheme for paying commissions for the extension of business.

Capt. White here said that the broader the investigation was made the more useful would the results in all probability be. The local conditions which make or mar the market have so much influence. The methods which succeed in one town quite fail in the next. But one thing that is certain is that we must have the aid of women. The Captain also went into some details in reference to his efforts to use gas for cooking, and emphasized his success by saying that when he lighted up his house his neighbors did not.

The President then put the motion on the question of the co-operation of the Association in the matter of the National Bureau of Advertising. It was agreed to and the appointment of a committeeman was ordered.

The Secretary then read the following paper on

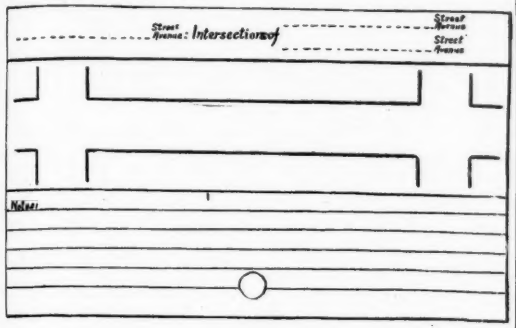
THE USE OF CARDS FOR RECORDS AND ACCOUNTS,

by Mr. William C. Anderson, of Norristown, Pa.

No doubt, somewhere in the workings of a majority of gas companies

to day, there may be found in use card systems of greater or less size and scope. This paper is a plea for their employment, to a fuller ex-

Form for Record of Mains.

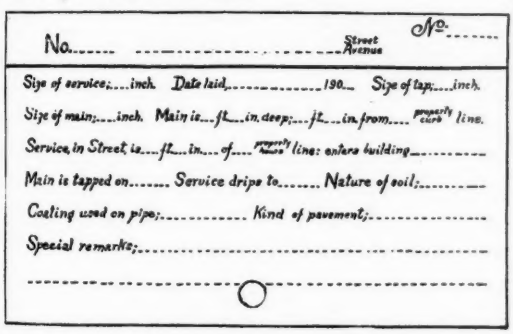


tent, in the place of books for the keeping of records and accounts, to the greater satisfaction of the employees concerned therewith, as well as to a more economical running of the office.

The outlay of money, at the start, for a suitable filing cabinet, is the only real expense connected with the use of the card system, for the cost of additional cards, as they may be required, from time to time, is so slight as to be considered a nominal expenditure.

First, as to records: Any information as to the location of property underground is valuable and should be recorded. Now, if that record be so made and so disposed that it may be readily gotten at when re-

Form for Service Records.

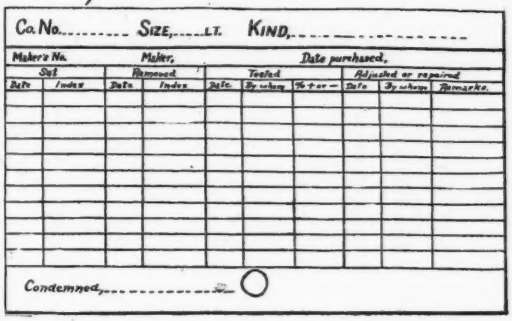

No.
Street Avenue
No.
Size of service;....inch. Date laid,.....190.. Size of tap;....inch.
Size of main;....inch. Main is....ft....in. deep;....ft....in. from.... property line.
Service, in Street, is....ft....in....of.... property line; enters building.....
Main is tapped on..... Service drips to..... Nature of soil;.....
Coating used on pipe;..... Kind of pavement;.....
Special remarks;.....

quired, its value becomes so much the greater. Thus the precept, "A place for everything, and everything in its place," that is found to be such a good rule of practice in the shop, finds its highest realization in the office, in the filing of information in a well arranged card system. Suppose that pipes have been uncovered, whose position has been more or less a matter of conjecture, or a new connection has been made, or a new service laid; in either case the true locations may be more easily noted on a card than in a book, especially if a sketch be made, which may be done on the back of the card. The card is then placed in its proper position in the cabinet, filed geographically, and is readily found when reference to it is desirable on account of the planning of other work to be done in the vicinity, or for other reasons, and that without loss of time.

A great advantage here; if a book be started for this same purpose, it is difficult at the beginning to so lay it out that it will be of the best arrangement, as the amount of information gathered increases. Too much space is left in one part of the book, too little in another, and a system of cross indexing soon becomes necessary. With cards, from the time the first one is filled up, the record is complete, and yet, it is never completed, and may be added to in any part.

Similarly, with meter records, kept on cards; cards are added, one for each new meter as these are purchased, and reference to them is far easier than when compelled to handle a large and unwieldy book. Cards of a different color may be used for each size of meter, so that

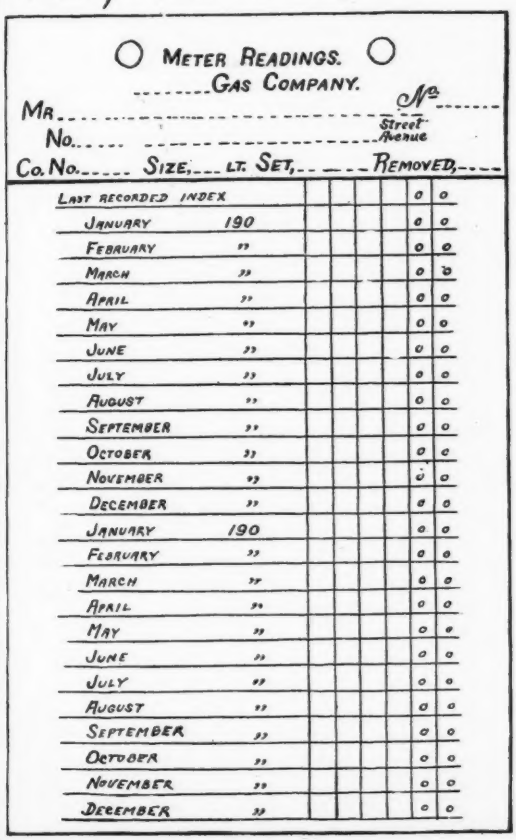
Form for Meter Records.



the counting of the cards of any color shows accurately the number of that particular size of meter owned at the time.

Cards are found to be especially valuable in place of the old form of route-book. They have a space at the top for the usual infomation (number and size of meter, etc., besides the consumer's name and address), and a convenient size of card will provide space for recording the monthly indexes for two years. Stout covers of leather are necessary, and the cards are secured in these by laces passed through eyelet holes in the covers and holes punched in the cards to correspond. This

Form for Meter Readings



plan has the same advantage of admitting of the placing of the cards just where they should come, and their order of arrangement should be such that the man who reads the meters will have the shortest distance to travel. The arrangement of all office accounts should be made to agree with this. When the meter is removed the card is extracted, and the indexer, on his next trip, wastes no time in looking for the meter, only to finally discover the word "removed" scribbled in some corner. There is no more turning forward and back two or three pages to find the next place to go to, the chances of placing the reading under the wrong meter are very much lessened, and thus is prevented the cause of many possible complaints. Men who have been used to route-books, and who thought this was "the only way," after trying these cards have acknowledged the great improvement, and the time saved by their use makes them worthy of consideration.

In the application of this system to the consumer's ledger, the cards employed have the record of the account at the top, beneath the consumer's name and address. Here is entered the size of the meter, date set or turned on, etc. Below this the card is so ruled, in columns and across, to provide for the entries, during one year, of meter readings with the dates, the consumption of gas and amount of bill, the discount (if allowed), the amount paid and the date of payment. Information may be drawn from this card-ledger with far greater ease and rapidity than from a book, and with far less chance of error than when having to pick out items from a large page. Transferring the cards from one compartment to another at each change in the condition of the accounts, keeps them separated in groups, and, by their position having a meaning, much time is saved that would be consumed in going over every page of a large ledger to draw off lists for various purposes. Accounts in arrears will naturally fall out and remain after those paid are transferred, and here is a list, ready made, since statements or notices may be made out by referring directly to the cards.

Form for Consumers' Ledger.

Mr. ..... No. .....

No. ..... Street Avenue ..... Deposit, $ .....

Meter No. ..... Size ..... lt. Set Turned on ..... Removed Turned off ..... Cause, ...

Date.	Index.	Consumption.	Amt. of bill.	Date paid.	Amt. paid.	Discount.
Brought forw'd	0 0					
Jan.	0 0	0 0				
Feb.	0 0	0 0				
Mar.	0 0	0 0				
Apr.	0 0	0 0				
May	0 0	0 0				
June	0 0	0 0				
July	0 0	0 0				
Aug.	0 0	0 0				
Sept.	0 0	0 0				
Oct.	0 0	0 0				
Nov.	0 0	0 0				
Dec.	0 0	0 0				

Carried forw'd, Index, ... Carried forw'd, Amount, $ .....

For example, a small company has on its books two thousand active accounts, and all but about two hundred and fifty of these are settled each month, on or before the last day allowed for discount. Each day, as payments are received on accounts, entries are made on the proper cards, which, when replaced in the cabinet, are put in another compartment, there to remain undisturbed until the time comes to enter on them another month's consumption, when the process is repeated. It is the smaller number of cards, which cannot be regularly "promoted" with the others, that causes all the worriment, and it keeps the collector on the alert to prevent them finding their way into a compartment labelled "bad and doubtful," having first successively passed through compartments "second notice," "third notice," and "cut off for non-payment." The discount period having passed, notices are mailed to all consumers whose account cards have not been transferred, and the forthcoming responses allow the passing on of about a hundred and fifty more, leaving but about one hundred accounts to be further dealt with. At this point the collector begins to refer to this small number of cards with which he is concerned, applying the methods that seem best suited to each case, and, by the time that the entire number of cards are ready to go through the mill again, they have nearly all been brought together under "paid-up accounts."

The carrying forward each month of unpaid balances, as done in some forms of ledger, is abandoned. The amount of money outstanding is obtained from a small number of cards that are in a place by themselves, and it is an easy matter to draw off the amounts. Furthermore, the greatest rapidity possible in working with cards enables one bookkeeper to look after a larger number of accounts than he could handle in book form, and in the case of a small company, reclaims much time that can be otherwise employed to good advantage.

Sales of appliances, and in the case of a company making coal gas, even sales of coke and tar, are of relatively infrequent occurrence. The method applied to these consists in making a ticket of sale for each transaction and filing it in the proper place. These are filed alphabetically and from them the bills are made out, and when payment has been received and the entries made, the tickets are put aside to be tied up and put away at the end of the month as finished business. Here, as in each of the other instances, no "dead wood" is carried along, and the object desired is to keep the number of cards requiring attention at a minimum, weeding them out and putting them aside as soon as possible.

Turning to the canvassing department, cards are made out and filed to keep a record of possibilities for future business. A likely consumer for some future time having been visited by a representative of the company, notes are made of the conversation as it occurred, and any offer made on the part of the company is recorded. These cards are looked over at short intervals, and at the proper time, another visit is made to each place and, later on, still another, if required, until that card has served its purpose, which is only accomplished when a card goes into the consumer's ledger, with the name of the same party at the top.

To insure the successful working of the system as described, it is necessary that one competent person be in charge of it, and that he be responsible for all the cards, and to prevent their improper handling or their removal by any one else besides that person, they should be held in place in the cabinet by a good locking device, requiring a key for their release.

In a company where the entire number of cards is too great for one

Form for Miscellaneous Sales Ticket.

Mr. ..... No. .....

No. ..... Street Avenue .....

Date.	Article, or articles, sold for cash or account.	Amount.	Date paid.
	bushels coke @		
	" - crushed @		
	gallons tar @		
	barrels " @		
	gas range		
	" heater		
	" water heater		
	Welsbach lights		

Canvasser's Form.

No. ..... Street Avenue

Tenant, ... Owner, ...

Building occupied as	Building is not piped.
Fixtures are not placed.	Service is not laid.
Use gas for light?	If not, why?
Use gas for fuel?	If not, why?
Ever used gas?	Where?
Why discontinued	
Cost of supplying:	
Fuel appliances in use	

Date, ... 190 . Signed, ...

Additional remarks on other side.

person to take charge of, they should be divided, each person using cards of a different tint, and being responsible for his own cards, which should cover the business of a certain geographical district.

Each variety of cards, and especially those used in the ledgers, should be numbered consecutively in one of the upper corners. Each new account will then carry the next number higher than the last. The extraction or loss of a card is thus easily detected by the failure to find a card for every number when running through them for the purpose. Since no card is removed from the cabinet, but only transferred to another part, until the end of the year, and the existing accounts at the beginning are placed on cards consecutively numbered, they are, at all times, in the main, in regular succession, and it is not a difficult or tedious matter to locate every one at any time.

Appended are forms designed for each of the uses mentioned in the foregoing. In their preparation, the constant aim has been to provide, in the printing, for all that could be so taken care of, thereby reducing, at every point possible, the amount of clerical labor required. One other use to which this method is being applied by a large gas company, is in the keeping of a close account of the condition of the stock in the storeroom. The writer makes no claim to have done more than suggest the subject, as it applies to gas companies, for there will constantly appear to the user new applications and possibilities of the card system.

[To be Continued.]

The Combustion of Acetylene in Air Enriched With Oxygen.

By Mr. G. L. Bourgerel, in *Moniteur Scientifique.*

During the course of various researches carried out in the laboratory of the "Société Volta," at Geneva, I had occasion to seek for a source of high temperature other than that of the electric furnace, so that all electro-chemical action might be avoided in the reactions I had occasion to study. As the "Société Volta" were manufacturers of carbide of calcium, I naturally made use of acetylene, which is, further, in general use in the laboratory, and I made use of a burner of a table blowpipe, such as is commonly used for glass blowing. By using compressed air or air from a bellows, and acetylene, I produced a very high temperature, by means of which pure nickel or pure gold could be melted with ease. But as this temperature still did not satisfy my wants, I replaced the compressed air by pure compressed oxygen, which can now be easily obtained in cylinders.

Great, however, was my surprise to see that the flame leaving the blowpipe was exceedingly brilliant, and that, as a matter of fact, the gases did not mix, but burned only on contact one with the other, as in a lamp flame, forming a corona of flame, empty in the center; then, little by little, there formed at the extremity of the central tube of the blowpipe a deposit of carbon which rapidly increased, taking the form of a truncated cone, with the base outwards. This hollow cone, resembling a pear in shape, is formed of very dense carbon, very sonorous and hard at the base of the flame—that is to say, the point of the cone. It is so brilliant that at this point the outside appeared to be almost white, while all the wider portion and the interior has the appearance of very fine, light carbon, similar to lampblack. Some individual cones were so hard at the narrow part that glass was easily scratched when fragments were rubbed on the surface with the aid of a cork.

The carbon thus deposited, when examined with a lens, has the appearance of an enormous number of cauliflowers crowded together. The inner side of this hollow pear is covered with a thin layer of lampblack, and under this coating the carbon is perfectly bright and polished, hard, and of a steel-grey color.

Its fracture is bright steel-grey at the lower portion, and becomes darker towards the large end; it is built up of superimposed layers, separated by very thin films of black, easily visible in the middle parts.

The very brilliant flame produced at the upper end of the cone is also very hot; on placing a piece of carbide of calcium the size of an egg in this flame it becomes red hot, and fuses, while at the same time swelling up and throwing off on all sides incandescent particles, which continue to burn in the same manner as iron burns in oxygen; this makes a very effective experiment. The temperature of the acetylene which burns in the air round the end of this carbon cone, though not immediately in contact with it, is not very high; it is only at a nascent red heat, and the examination of this flame quite justifies the theory of the dissociation of the acetylene at the moment of its combustion.

To return to the description of this curious experiment: As I did not want an incomplete combustion in my blowpipe, the idea occurred to me to return to the use of compressed air, and to introduce pure oxygen to enrich the air, by means of a branch tube joining the one which supplied the air.

In this manner the proportions of air and oxygen to each other and to the acetylene could be varied, and flames of complete combustion produced having a neutral character, so to speak, neither oxidizing nor reducing; while, on the other hand, by increasing the amount of oxygen very hot oxidizing flames could be obtained.

Thus in a non-luminous flame of this latter kind, a morsel of carbide of calcium became dissociated, losing its carbon and becoming covered with a layer of fused carbonate of lime, a remarkable fact, while a small portion of the calcium is volatilized, and colors the flame red.

By using the blowpipe with a mixture of air and oxygen, as I have described, we have at once a convenient source of intense heat, comparable with that of the electric arc, by means of which platinum itself can be melted in a few seconds, and which is free from the drawbacks inherent to the use of the electric arc, which is always reducing and carburizing, and to the use of the oxyhydrogen blowpipe; both in commercial work, as well as in the laboratory, there are immense advantages to be gained by the use of such a source of heat.

An Elaborate System of Records for a Lighting Company.

By Mr. John Lyle Clough, *Municipal Engineering.*

In making the award to the representatives of gas and electric lighting companies, who submitted samples of bookkeeping blanks several months ago, the committee selected by *Municipal Engineering*, awarded a prize to James R. Shurtz of the Trenton (N. J.) Gas and Electric Company, and made special mention of the forms submitted by him, particularly referring to their fullness, and the care with which they were prepared before sending in. In point of fact, the blanks are so elaborate and comprehensive that it is not possible in any single magazine article to give more than a general survey of them, while many details of minor importance must be omitted entirely. This will be apparent when it is understood that the blanks submitted represent upwards of twenty different books, many of them very large and full, while there are approximately thirty-five minor blanks, all more or less intimately associated with each other, and with the larger bound forms. If any errors have been made in their preparation they have been in the direction of a too full and minute elaboration which necessarily entails needless labor and expense in their care. The stationery account of such a corporation must be an important one. The printer who is fortunate enough to secure the patronage of this particular company is entitled to full credit for having done his portion of the work most excellently. If a sufficient clerical force is provided to care properly for this set of forms, it would be difficult to cite any fact or figure relating to the transactions of the company which is not available, if one knows where to lay his hand upon it.

Among the minor blanks used by this company are the following:

An application for gas service of the usual form, a receipt for cash deposits from consumers and eleven different forms of slips of uniform size and arrangement, comprising orders for various classes of construction and other work in connection with the consumers' service, to which is attached by a perforated line a stub which is torn off and retained in the office when the order is issued to the company's employee who is charged with the work. The orders all relate to the "gas department" and their general nature will be understood from the heading of each, which is printed in heavy faced type. These headings are:

"Extend main."
"Service."
"Set meter."
"Change meter."
"Take index."
"Test meter."
"Miscellaneous work."
"Gas stoves."
"Take index and transfer."
"Miscellaneous street work."

While it is not practicable to copy them all, they are yet of sufficient

importance to justify transcribing several of them here. The size of each slip, including stub, is four inches by nine inches, a size which admits of their being filed, and subsequently referred to with ease. The order for the extension of main is arranged as follows:

ORDER NO.... GAS DEPARTMENT.

TRENTON GAS & ELECTRIC CO.

.....1900.

Extend Main.

Place.....
Size of main.....
Depth laid.....
Pipe used.....
Specials used.....
Work begun.....work finished.....
Done by .....
Cost per foot for pipe laid.....

ENTERED—Order book, Page....by....
Main record, Page....by....
(*over*)

(Stub.)

Order No..... .....1900.

Extend Main.

Name.....
Premises,.....
Being done by.....
Order returned.....
Remarks.....

(Reverse.)

Material.....		
Labor.....		
Total cost....		

Location of.

The order for service connection reads:

ORDER NO.... GAS DEPARTMENT.

TRENTON GAS & ELECTRIC CO.

.....1900.

Service.

Name.....
Premises.....
Size of main.....
Size of service.....
Pipe used.....
Fittings used.....
Distance main to curb.....
Distance curb to cellar .....
Depth and condition of main....
Service drips towards.....
Date when done.....
Done by.....

ENTERED—Order book, Page....by....
Service record, Page....by....
(*over*)

(Stub.)

Order No..... 1900

Service.

Name.....
Premises.....
Being done by.....
Order returned.....
Remarks.....

(Reverse.)

Material.....		
Labor.....		
Total cost...		

1. Location of tap in main.
2. Location of bends or elbows.

The order for miscellaneous work reads as follows:

ORDER NO.... GAS DEPARTMENT.

TRENTON GAS & ELECTRIC CO.

.....1900.

Miscellaneous Work.

Name.....
Premises.....
What done.....
Material used.....
Date when done.....
Done by.....

ENTERED—Order Book, Page....by....
Page....by....
(*over*)

(Stub)

Order No..... 1900

Miscellaneous Work.

Name.....
Premises.....
Being done by.....
Order returned.....
Remarks.....

(Reverse.)

Material.....		
Labor.....		
Total.....		

Remarks.....

It is not definitely stated how these blanks are to be filed. From their nature, however, it is evident that they must be easy of access at all times. That being the case they could be very much improved were they changed in form, size and weight, so that they could be adapted to the Card Index System. The Card Index is so generally understood, and has come into such wide popularity that its availability for such work as this will be readily recognized. It is true that the original expense would be somewhat greater than the cost of the blanks which are now in use, but with a large company which is obliged to keep an enormous amount of such records on file anyhow, the point of convenience is of first importance, and takes precedence of considerations of minor economies. No system of filing records that has ever been introduced compares with the Card Index System. No other system can be adapted to as many varying requirements, and no other system has ever before won as many warm friends in the same length of time. The particular blanks in question are not the only ones in use by the Trenton Company to which the Card Index System might be profitably applied, but mention of the others will be made later.

The other minor blanks submitted by this company, among them being meter books, gas range permits, collection books, etc., are not

essentially different from those in use by other companies. The Trenton Company employs the voucher system in paying accounts of all kinds, and submits a form of voucher and receipt.

The vouchers are designed to be filed in numerical order, and on the back is a series of divisions for distributing the amount of the voucher among the various accounts to which it is to be charged. If this blank was made to combine the check and voucher in one it would be thereby improved. The advantage to be derived from combining the check with the voucher consists in the fact that it involves less labor in filling the form out, and the receipt is necessarily returned in every case because the check cannot be cashed without the receipt having been properly signed; whereas, when the voucher and check are separate it is frequently necessary to write and re-write for the return of the voucher long after the check itself has been cashed. A description of the larger books used by the Trenton Company will be given in a subsequent issue.

A 150-Horse Power 3-Stage Compressor.

Engineering Record says that a 150 horse power compressor, designed to compress carbonic acid gas to a pressure of 1,200 pounds per square inch, has just been built by the McKiernan Drill Company, of New York City, from the plans of Mr. Charles H. Sargeant, its Engineer. The machine is a horizontal steam driven 3 stage compressor and possesses a number of interesting features. Among these may be mentioned, in brief, a means of carrying leakage from the intermediate and high pressure cylinders to the inlet of the low pressure cylinder, a ready means for examining the second intercooler, if desired, a joint arranged to hold its packing fast, and accessible valves and cylinder heads. The cylinders, heads and first and second intercoolers are, of course, water jacketed, and caps or plates are provided for removing any sediment in the parts. As a straight line machine for this pressure it is certainly a very large one.

The steam cylinder is 22 inches in diameter, with 24-inch stroke, and it is designed to develop full power with steam at 60 pounds pressure and a speed of 70 revolutions per minute. The steam chest is above the cylinder, a double slide valve is used, driven from two independent eccentrics, and speed regulation is by fly-ball governor. The three air cylinders are arranged in line, the low pressure, which is double acting, next to the steam cylinder, and the intermediate and high pressure cylinders, both of which are of the single acting type, beyond, with their abutting ends connected together. The air cylinders are 16, 11 and 4½ inches, respectively, in diameter. The compression valves are of the poppet type and are arranged to fall naturally to their seats.

The first intercooler is the type employing a number of small tubes through which the air is passed, the working pressure of 75 pounds above the atmosphere admitting of this usual construction. In the second intercooler a comparatively long, single 5 inch pipe is used, the slow passage of air through it providing for the cooling. The pipe is enclosed in the water cooling chamber.

The high pressure connections required in these cases are fitted with asbestos packing rings which are pressed between the flange and the casting on which it is seated. The rings lie in an annular cut in the casting and are held on the outside by the casting and on the inside by the projection of the flange, this being continued at reduced diameter to slip within the opening to be connected. As was mentioned, the intermediate and high pressure cylinders are connected together, and at this point, the leakage pipe is taken to the low pressure cylinder, catching the air which may leak by the intermediate and high pressure piston rings.

A short test of the machine was made with steam supplied from a 25-horse power boiler equipped with an automatic powdered coal burning apparatus, and generating steam at 75 pounds pressure. The discharge of the compressor was led into a 5 inch, double extra strong pipe, 10 feet 6 inches long, in which the air was brought to a pressure of 1,500 pounds in about 4 to 5 minutes, with the machine working at an average rate of 40 revolutions per minute.

THE bidding for the public street lighting of Springfield, O., in so far as that may be accomplished by gas, elicited the following tenders by the Springfield Gas Company—the Company proposes to use the Welsbach system, on an all night and every night basis: Three-year contract, $28 per post per annum; five-year, $25 per post; ten year, $23 per post. It is further specified that no less than 560 lamps shall be used.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR. WILLIAM T. MORRIS, of Penn Yan, N. Y., and his associates have purchased the properties and franchises of the Niagara Falls (N.Y.) Gas Company. The new management assumed control the first inst.

MR. A. F. JENKINS, formerly in charge as Superintendent of the Newark, (N. Y.) Gas Light and Fuel Company, has been transferred to the service of the Gas Light Company of Waverly, N. Y.

MR. M. NISBET LATTA has been appointed Superintendent of the Gas Department of the Charlotte (N. C.) Electric Railway, Light and Power Company.

THE contract for seven new bridges on the Allegheny Valley Railroad has been awarded to the American Bridge Company.

MR. L. N. CASE, the alert manager of the Duluth (Minn.) municipal gas works, reports a gain in output for September, 1900, as compared with the corresponding month of 1899, amounting to 21 per cent. That is a pretty good showing.

A CORRESPONDENT in Riverside, Cal., forwards the following under date of October 29th: "The annual meeting of the Riverside (Cal.) Gas and Electric Light Company was held last week. The annual report of the President (Mr. W. A. Hayt) showed that the business of the Company had increased greatly during the year; and the annual report of the Secretary and Treasurer (Mr. C. P. Hayt) was corroborative in every respect of the President's findings. The floating debt of the Company has been paid up. The annual election resulted in the following choices for officers: Directors, W. A. Hayt, J. H. D. Cox, A. A. Caldwell, C. P. Hayt and George W. Cobb; President, W. A. Hayt; Vice-President, J. H. D. Cox; Secretary and Treasurer, Chas. P. Hayt."

WE are informed that Frank Smith is no longer in the service of the Owosso (Mich.) Gas Light Company.

MR. HENRY A. HALE, President of the Salem (Mass.) Gas Light Company, says there is no foundation whatever for the statement that his Company intends to in anyway interfere with the gas supply of the neighboring district of Danvers.

THE North Shore Gas Company, which was incorporated some days ago at Springfield, Ills., by Messrs. W. Irving Osborne, Fred. W. Bentley and Marshall C. Smith, is more than likely controlled by the syndicate (headed by the Messrs. Dawes) that owns the Northwestern Gas Light and Coke Company, of Evanston, Ills. It is further presumed that the new concern is to take over and operate all the small gas properties hitherto under the nominal dominion of the Waukegan Gas Company. All these properties are located within striking distance of each other on the north shore of Lake Michigan.

THE structural steel work of the Germantown Junction new station of the Pennsylvania Railroad will be furnished by the American Bridge Company.

MR. S. J. FOWLER, General Manager of the Springfield (Mass.) Gas Light Company, in speaking recently for publication, said: "At a meeting of the Board of Directors of the Springfield Gas Light Company held October 30th it was voted to accept the recommendation of the Board of Gas and Electric Light Commissioners that the net price of gas in this city be reduced to a cost of $1.05 per 1,000 cubic feet. The Directors voted that the gross price should be $1.20 per 1,000 feet, subject to a discount of 15 cents for cash payment of the bill at the office of the Company, if paid on or before the 10th of the month in which the bill was rendered. This price is, all things being considered, the lowest ever made by the Commission in any city in the State, with the exception of Haverhill, and is almost exactly the equivalent of the price which the Company would have made if there had been no agitation or disturbance of the subject of the price of gas at all. In fact, the whole trouble and expense to the city and the Company have been wholly wasted, as far as the price of gas in the city is concerned, but when an appeal had been made to the Commission, the Company was perfectly willing to leave the decision as to the price to the State authorities."

If any of our readers can assist Mr. Williams in his desire to locate the parties named in his subjoined letter, our obligations will be added to his:

HELENA POWER AND LIGHT COMPANY,
HELENA, MONTANA, Nov. 3, 1900.

To the Editors AMERICAN GAS LIGHT JOURNAL: Can you, or any of the readers of the JOURNAL, tell me who manufacture "The Unique Gas Water Heaters?" In 1897 they were manufactured by the Carroll Manufacturing Company, 559 Carroll avenue, Chicago, but orders sent there recently were returned marked "Cannot be found." It would strike me that an ad. in the JOURNAL would succeed in selling numbers of those heaters for the manufacturers, as it is an excellent heater. The information asked for will oblige, very truly yours, C. M. WILLIAMS, Supt. Gas Department.

MR. C. J. R. HUMPHREYS, Agent and Manager of the Lawrence (Mass.) Gas Company, acting on its behalf, has applied formally to the Selectmen of the adjoining town of Andover for the right to supply gas therein.

MR. J. H. CHRISTIAN, formerly of Cleveland, Ohio, has been appointed superintendent of the electric division of the plant of the Spencer (Mass.) Gas Company. Mr. Thomas H. Clark, of course, continues in charge of the Company's gas system.

MR. CHARLES H. NETTLETON has been elected President of the Derby (Conn.) Gas Company, vice the late Colonel William B. Wooster. Mr. George H. Scranton has been elected Secretary to the Company.

THE regular monthly dividend of the Pacific Gas Improvement Company, of San Francisco, Cal., has been reduced to 30 cents per share, a cut of 5 cents.

ADVICES from Newark, N. J., under date of the 3d inst., are to this effect: "Mr. John F. Shanley was formally elected President of the Essex and Hudson Gas Company, of Newark, at a meeting of the Directors held the 1st inst. Mr. Shanley, in taking the position, thanked the Directors for the confidence they reposed in him, and expressed his readiness to co-operate with them in the successful management of the property. It was deemed advisable to have a Second Vice-President, and Senator T. N. McCarter was unanimously chosen to fill the new position. That the Second Vice-President might also be a member of the Directors a vacancy in that body was created by the voluntary withdrawal of Uzal H. McCarter, President of the Fidelity Trust Company and a brother of the Senator."

THE Northern Pacific Railroad Company will build new shops at Brainerd, Minn., the steel work of which will be furnished by the American Bridge Company.

THE Mayor of Matanzas, Cuba, Mr. D. Leucoma, advertises that the municipality of Matanzas will receive proposals up to the 15th prox., for providing the city of Matanzas with electric or gas lighting and with electric tramways. The proposals can be made to include both services of lighting and tramways, or for each separately, the municipality reserving the right to accept or reject any or all of the proposals. These latter must adhere to the essential conditions contained in the specifications, which will be furnished on application. The specifications can also be obtained by applying at the office of Messrs. Jimenis & Co., 114 Wall street, New York city.

NOW that the betterments on the plant of the municipal gas works at Richmond, Va., have been virtually completed, Councilman Wallerstein proposes to force his resolution ordering a reduction in the selling rate to 80 cents per 1,000 cubic feet.

THE Kerlin Brothers Company, of Toledo, O., having purchased from the authorities of Toledo certain properties connected with the former supply of natural gas in that city by the authorities, seem to be entangled over what they thought they were buying and that which they are receiving. At least such inference would seem fair, in that, under date of October 29th, they sent the following missive to—

"His Honor the Mayor and the Common Council, City of Toledo: Gentlemen—Upon examination we find that the 10 and 12 inch natural gas main line purchased of you does not contain within 4 or 5 miles of the amount of pipe represented in your inventory. We will expect you to make good the loss we may sustain by reason of such shortage. We are now engaged in removing this pipe, and in order to avoid any controversy as to the amount of such shortage, we respectfully request that your Honorable Body take proper action toward ascertaining the exact amount of pipe contained in said line, as compared with the amount represented and sold to us. A copy of this resolution has been addressed to the Board of Gas Trustees, who no doubt will co-operate with you, and *may* be able to account for the shortage referred to."

MR. C. S. J. RUGGLES, Superintendent of the Gardner (Mass.) Gas, Fuel and Light Company, has arranged for the replacing of the existing oil gas generating plant with an improved water gas system. It is about time that the owners of the Gardner Company made a shift.

THE comedy of errors existing in the determination arrived at by the City Electrician of Chicago (Mr. Ellicott) that the candle power of the gas supplied by the Peoples Gas Light and Coke Company was not up to contract, still continues. Mr. Ellicott, however, when the determinations are officially concluded, may have more faith in the ancient remark, which distinctly declares that the wise cobbler is the one who sticks to his last.

THE Honorable Thomas H. Malone, President of the Nashville (Tenn.) Gas Company, is one of the best jurists in the Middle Southwest, and is also, in all the best sense of the title, a gentleman. We hope, though, that he will never experience any discomfort as a gas man from the publication of a certain letter, written by him under date of October 24, to Mr. M. S. Barker, Vice-President of the National Coal and Iron Company, of Louisville, Ky. The letter details certain results secured in the carbonization of the National concern's brand of Straight Creek coal. These results, which we hope have been verified many times, go to show that from the Straight Creek article a yield of 5.03 cubic feet to the pound, of 18.1-candle gas, was obtained.

ACCORDING to the daily press a "savant," who lives in Salt Lake City, has developed a process under which he is enabled to secure "a seven hundred-candle power light" from a pint of kerosene. That result is simply wonderful, when one considers that one pint equals a small bottle. It is further said in the press dispatches that a Congressman and a Judge are backing the claims of the inventor, which makes the wonder all the larger; for what would a small bottle be among so many!

Electricity says that during the recent political campaign a Port Chester (N. Y.) band of 40 pieces attracted much attention during its animated wanderings through Westchester county. Each musician carried a small electric light on his instrument. The current was furnished by a storage battery, which he carried in his pocket. The lights, as to the shading thereof, were of different colors.

IN mentioning a new sort of wooden water pipe, *Engineering News* notes that engineers are quite familiar with the two sorts of wooden water mains which have been on the market for years, and which are commonly known as the Wyckoff pipe and the continuous wood stave pipe. A new kind of wooden pipe has recently been brought forward by a company at Spokane, Wash., and over 100,000 feet of it have already been laid in Washington and Idaho. This new pipe is made, like the Wyckoff pipe, in standard lengths, but instead of being cut out of a solid log in one piece, like the Wyckoff pipe, each length is made up of staves, wound with galvanized steel wire under tension. The sizes made are 2 to 8 inches, internal diameter. The staves are kiln dried Oregon fir, $\frac{7}{8}$-inch to $1\frac{1}{4}$ inches thick. Joints are made with a male and female socket on the small sizes and a sleeve and butt joint on the larger sizes.

Some 8-inch pipe of this sort wound with No. 4 copper wire has been tried in the mines of Butte, Montana, where the acid water rapidly destroys ordinary iron pipes, and with excellent results. This pipe has been tested to 500 pounds pressure. The price of this class of pipe in the locality where it is used is said to be 15 per cent. to 50 per cent. below the price of iron pipe. The pipe is put on the market by the Spokane Galvanized Wire Pipe Co., of which Mr. J. C. Ralston is President.

AT the annual meeting of the Albion (N. Y.) Gas Light Company, which finally seems to have come under the control of reputable people, the following executive management was chosen: President, Gen. Bird W. Spencer—the General is also Vice-President of the Paterson and Passaic Gas and Electric Company; Secretary and Treasurer, Mr. H. H. Copeland. Mr. W. B. Russell, we are glad to say, will continue to act as the Company's Manager.

THE AMERICAN GAS LIGHT JOURNAL

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CHAS. E. SANDERSON, MANAGER.

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MONDAY, NOVEMBER 12, 1900.

The Market for Gas Securities.

The verdict of the voters that the nation is to have four more years of Mr. McKinley and the policies for which he stands had the undeniable effect of electrifying the share market. Everything is on the boom just now, and, in common with the rest of the specialties or generalities on the list, gas shares are participating in the soaring. Consolidated sold to-day (Friday) at 185, and closed at 184½, or a gain for the week of 11 points. The gain for the next six weeks or so will be much more pronounced. Our quotations for Standard common or preferred, show no change; but holders of either need not fear that they will have trouble in disposing of their holdings at the noted rates. Our list is blank in the matter of quotations for Mutual.

Brooklyn Union showed a bit of its quality last week, and its Directors showed a trifle of mercy to the shareholders in increasing the annual dividend rate to 8 per cent. It should be paying 12 per cent. The balance of the outside gas share market is all in favor of the investor, notably in the instance of Peoples, of Chicago; Consolidated, of Baltimore; and Washington, D. C. It is a pity that some one who knows something about gas making is not put in charge of that Company's engineering affairs.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

NOVEMBER 12.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$54,595,200	100	184¼	184½
Central Union, Bonds, 5's	3,000,000	1,000	106	107½
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	120	..
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	..	.
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	.	..	.
New Amsterdam Gas Co. .. Bonds, 5's	11,000,000	1,000	103¼	106
Northern Union, Bonds, 5's.	1,250,000	1,000	104	104¼
New York and East River . Bonds 1st 5's	3,500,000	1,000	105	106⅜
" 1st Con. 5's	1,500,000	..	115	.
Richmond Co., S. I.	348,650	50	70	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	130	133
Preferred	5,000,000	100	150	153
Bonds, 1st Mortgage, 5's	1,500,000	1,000	114	114
Yonkers	299,620	500	130	.
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	176	177
" " Bonds (5's)	15 000,000	1,000	118	119
Bay State	50,000,000	50	1⅛	1⅜
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works. .	450,000	100	25	28
" 1st Mtg. 5's	475,000	1,000	96⅜	99½
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	..	4½
" " Bonds, 5's	5,250,000	1,000	63	65
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati G. & C. Co.	8,500,000	100	191	192
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,207,000	1,000	106	107
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	60	65
Preferred	3,026,500	100	84	86
Consumers, Jersey City Bonds	600,000	1,000	102	105
Consumers, Toronto	1,700,000	50	215	216
Consolidated, Baltimore	11,000,000	100	56	56½
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	11	14
" Con. Mtg. 5's	380,000	1,000	80	85
Consolidated G. & E. Co.'s, Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co	4,560,000	50	95	97
" Prior Lien 5's	4,598,000	1,000	99½	100
Detroit Gas Co., 5's	388,000	1,000	100	101
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	35	40
Fort Wayne	2,000,000	..	35	41
" Bonds	2,000,000	..	60	64
Grand Rapids Gas Lt. Co.	1,000,000	50	105	107
" 1st Mtg. 5's	1,125,000	1,000	..	..
Hartford	750,000	25	..	280
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	72	82
" Bonds, 6's	2 650,000	..	98	100
Jackson Gas Co	250,000	50	70	75
" 1st Mtg. 5's	250,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	101½	103
Laclede, St. Louis	7,500,000	100	68½	70
Preferred	2,500,000	100	98	100
Bonds	10,000,000	1,000	107	107½
Lafayette Gas Co., Ind.	1,000,000	100	35	40
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	110	120
Madison Gas & Elec. Co.	400,000	100	68	75
" 1st Mtg. 6's	350,000	1,000	102½	108
Montreal, Canada	2,000,000	100	182	184½
Newark, N. J., Con. Gas Co	6,000,000	..	..	55
Bonds, 6's	4,600,000	..	..	103
New Haven	1,000,000	25	280	300
Nashville Gas Lt. Co.	1,000,000	50	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	98⅝	98⅝x
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	90¾	91
2d "	2,500,000	1,000	104	105
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	47¼	47½
St. Paul Gas Light Co.	1,500,000	100	46	49
1st Mortgage 6's	650,000	1,000	82	85
Extension, 6's	600,000	1,000	..	..
General Mortgage, 5's	2,428,000	1,000	88	90¾
St. Joseph Gas Co.	1,000,000	100	30	35
" 1st Mtg. 5's	750,000	1,000	96½	98
Syracuse, N. Y.	1,750,000	100	9	10
Bonds	1,612 000	1,000	88½	93
Washington, D. C	2,800,000	30	270	271
First mortgage 6's	600,000	..	.	..
Western, Milwaukee	4,000,000	100	90	91
Bonds, 5's	3,880,500	..	107	107½
Wilmington, Del.	600,000	50	200	201

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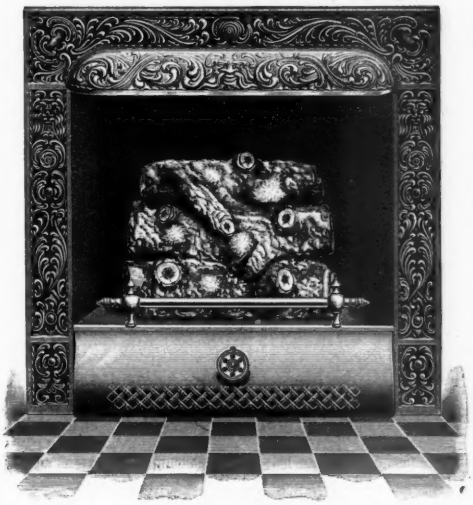

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Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

They are Strong and Compact.

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Machines Sent to any Gas Company for Thirty Days' Trial.

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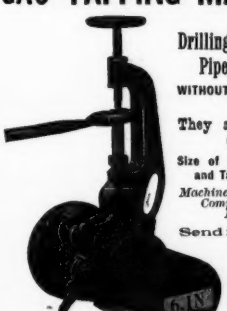
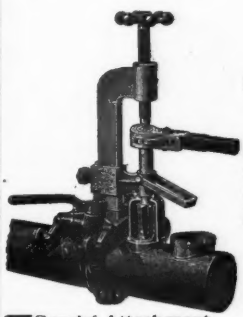


Geo. Light,

DAYTON, O.



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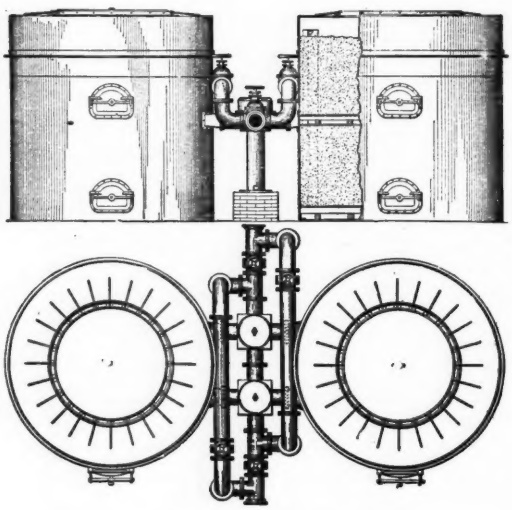

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Covered by Five U.S. Patents.

In operation, revivification of the oxide is effected by repeated reversals of the direction of the flow of the gas through the beds (in the two boxes used under this system there are eight different routes for the gas to take) whereby the purified gas is made to revive the oxide in parts of the apparatus while the foul gas is fouling it in others.

The boxes are charged or discharged from the sides as well as the top.

There are no Hydraulic Cups or heavy covers.

Either end of the apparatus is inlet or outlet at pleasure.

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The apparatus costs less than for any other system.

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Blackburn, England	1,250,000
Windsor Street Works, Birmingham, England	2,000,000
Saltley Works, Birmingham, England	2,000,000
Colchester, England	300,000
Birkenhead, England	2,250,000
Swindon (New Swindon Gas Company), England	120,000
Saltley Works, Birmingham, England (Second Contract)	2,000,000
Windsor Street Works, Birmingham, England (Second Contract)	2,000,000
Halifax, England	1,000,000
Toronto	250,000
Ottawa	250,000
Toronto (Second Contract, Remodeled)	2,000,000
Lindsay (Remodeled)	125,000
Belleville	250,000
Ottawa (Second Contract)	250,000
Brantford (Remodeled)	200,000
St. Catherine's (Remodeled)	250,000
Kingston, Pa.	125,000
Montreal	500,000
Peterborough, Ont.	250,000
Wilkesbarre, Pa.	750,000
St. Catherine's (Second Contract)	250,000
Buffalo, N. Y.	2,000,000
Winnipeg, Man.	500,000
Colchester, England (Second Contract)	300,000
York, England	750,000
Rochester, England	500,000
Kingston, Ont.	300,000
Crystal Palace District, England	2,000,000
Duluth, Minn.	300,000
Caterham, England	150,000
Enschede, Holland	150,000
Leicester, England	2,000,000
Buenos Ayres (River Platte Co.)	700,000
Burnley, England	1,500,000
Kingston-on-Thames, England	1,750,000
Accrington, England	500,000
Tonbridge, England	300,000
Stretford, England	500,000
Oldbury, England	300,000
Saltley Works, Birmingham, England (Third Contract)	2,000,000
York, England (Second Contract)	750,000
Rochester, England (Second Contract)	500,000
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Gas, Electric Light, Water Works, and Electric Street Railways Built, Remodeled, Operated, Bought and Sold.

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Ilion, N. Y.
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Little Falls, N. Y.
Fishkill-on-Hudson, 2 orders.
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Stevens Point, Wis.
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Huntington, L. I.
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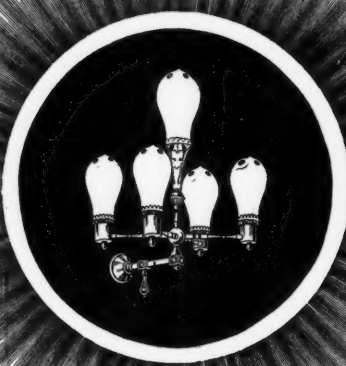

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SAVES 80 PER CENT. OF YOUR GAS BILL.

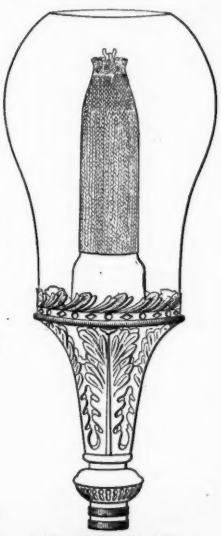
THE NEW DISCOVERY.
BURNS ONE CUBIC FOOT OF GAS PER HOUR.

No Chimneys to Break. Mantles do not Blacken. Better than Electricity, and only 1-10th the Cost. Not a mere statement, but a Guarantee.

CAN BE USED WITH { MANUFACTURED GAS. NON-CARBURETTED GAS. NATURAL GAS OR GASOLINE GAS.

35 TO 40 CANDLES PER CUBIC FOOT.

Burner No.	0	consumes	8-10	cubic foot,	30-candle	power.
"	1	"	1	"	35	"
"	2	"	2	cubic feet,	70	"
"	3	"	3	"	105	"
"	4	"	4	"	140	"
"	7	"	7	"	225	"



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Do You Appreciate the Important Bearing of **Purifying Trays** upon **Back Pressure?** You can obtain **Increased Purification** by Using **Our Trays** in your Boxes.

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PRESSURE GAUGE.
For continuous records of **Street Gas Pressure.** Simple in construction, accurate in operation, and low in price.
Fully Guaranteed. Send for Circulars.
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MANUFACTURERS OF
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Double and Single Gate Valves, ¼" to 72",
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Gas, Water, Steam, Oil, Ammonia, Etc.
HOT GAS VALVES A SPECIALTY.
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Steward Burners.

Closest Attention to **Durability, Candle Power, Finished Appearance.**

Samples to be Had for the Asking.

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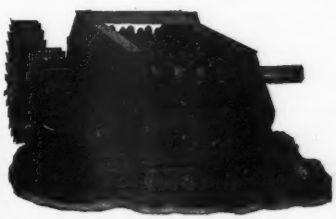

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Tilting Coal and Coke Cars, Breaker Rolls, Shaking Screens, Power Transmitting Machinery.
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NEW GAS GOVERNOR AND STEAM VALVE.

GUARANTEED TO REGULATE WITHIN ONE-TENTH OF AN INCH, WATER PRESSURE.

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MORE DIRECT IN ACTION. FEWER PARTS.
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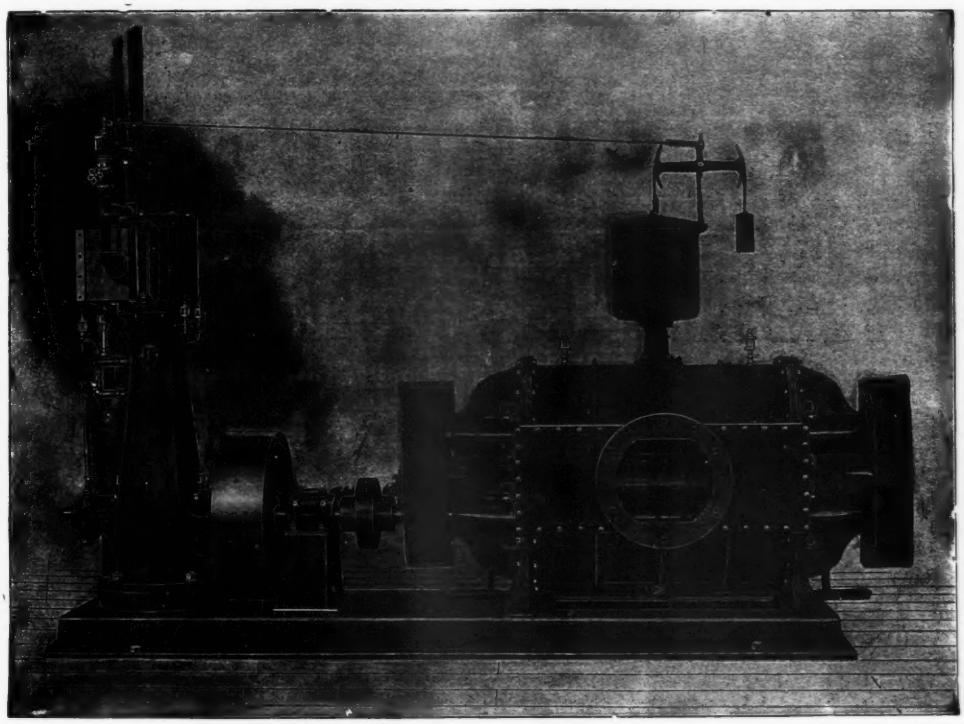

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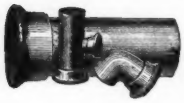

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From Three to Forty-Eight Inches Diameter. Also, all Sizes of

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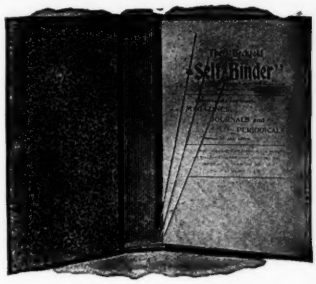

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STORAGE TANKS FOR GAS WORKS,

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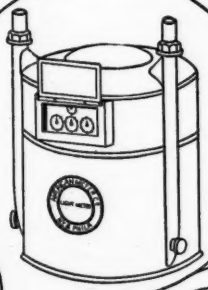
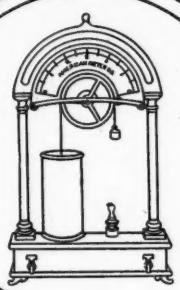
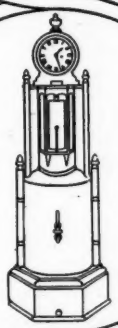
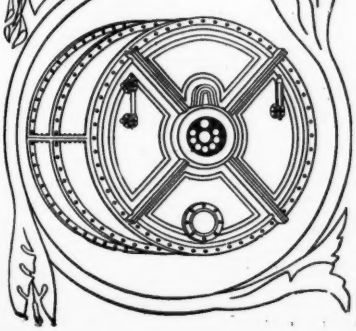




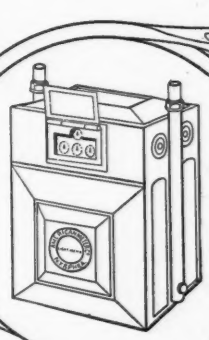


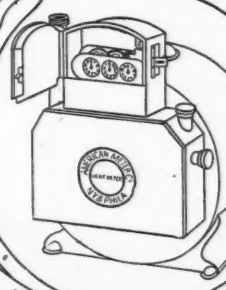


PUBLIC LIGHTING TABLE.

NOVEMBER, 1900.

Day of Week.	Table No. 1. Following the Moon. Date.	Light.	Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Extinguish.
				P.M.	A.M.
Thu.	1	12.10 AM	5.30 AM	4.45	5.35
Fri.	2	1.30	5.30	4.45	5.35
Sat.	3	2.40	5.30	4.45	5.35
Sun.	4	3.50	5.30	4.45	5.35
Mon.	5	No L.	No L.	4.40	5.45
Tue.	6	No L. FM	No L.	4.40	5.45
Wed.	7	No L.	No L.	4.40	5.45
Thu.	8	5.20 PM	7.20 PM	4.40	5.45
Fri.	9	5.20	8.20	4.40	5.45
Sat.	10	5.20	9.20	4.40	5.45
Sun.	11	5.10	10.30	4.40	5.45
Mon.	12	5.10	11.30	4.30	6.00
Tue.	13	5.10 LQ	12.30 AM	4.30	6.00
Wed.	14	5.10	1.30	4.30	6.00
Thu.	15	5.10	2.20	4.30	6.00
Fri.	16	5.10	3.20	4.30	6.00
Sat.	17	5.10	4.20	4.30	6.00
Sun.	18	5.10	5.50	4.30	6.00
Mon.	19	5.10	5.50	4.25	6.00
Tue.	20	5.10	5.50	4.25	6.00
Wed.	21	5.10 NM	5.50	4.25	6.00
Thu.	22	5.10	5.50	4.25	6.00
Fri.	23	5.10	5.50	4.25	6.00
Sat.	24	5.10	5.50	4.25	6.00
Sun.	25	5.10	6.00	4.25	6.00
Mon.	26	7.50	6.00	4.20	6.10
Tue.	27	9.00	6.00	4.20	6.10
Wed.	28	10.00	6.00	4.20	6.10
Thu.	29	11.10 FQ	6.00	4.20	6.10
Fri.	30	12.20 AM	6.00	4.20	6.10





TOTAL HOURS LIGHTING DURING 1900.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January	230.50	January	423.20
February	175.40	February	355.25
March	189.00	March	355.35
April	160.30	April	298.50
May	150.40	May	264.50
June	137.00	June	234.25
July	152.00	July	243.45
August	171.50	August	280.25
September	187.20	September	321.15
October	213.10	October	374.30
November	221.50	November	401.40
December	231.50	December	433.45
Total, yr.	2221.40	Total, yr.	3987.45

NEW YORK, 33 Nassau St. PHILADELPHIA, Broad and Arch Sts. CHICAGO, 54 Lake St.

Welsbach Street Lighting Company

.... OF AMERICA ....

No. 36.

Controls and Operates the

Welsbach System of Street Lighting,

Which includes its specially DESIGNED AND PATENTED BURNER for STREET and PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in seventy-five Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

No. 38.

Correspondence solicited from Gas Companies and others interested in Municipal and outside lighting.

Welsbach Famous Mantles.

THE INCOMPARABLE

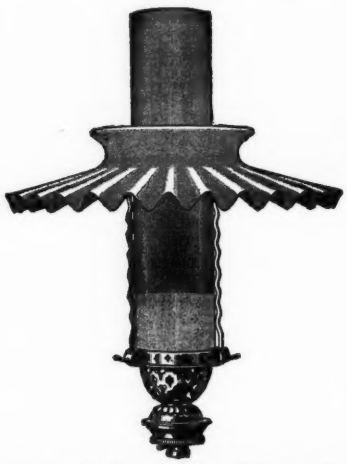
"Yusea" Welsbach Mantle

FINEST EXAMPLE

OF INCANDESCENT

GAS LIGHT

EVER EXHIBITED.



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Magnificent Brilliancy

—AND—

Endurance.

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WEST CHESTER, PA.	1	TIFFIN, O.	1
COHOES, N. Y.	2	MOUNT HOLLY, N. J.	1
OGDEN GAS CO., CHICAGO	1	SEATTLE, WASH.	1
CENTRAL UNION GAS CO., NEW YORK	1	TARRYTOWN, N. Y.	1
SPENCER, MASS.	1	HOBOKEN, N. J.	2
SAN FRANCISCO	1	PATERSON, N. J.	2
BROOKLYN UNION GAS CO., BROOKLYN	1	NEWARK, N. J.	2
RICHMOND, VA.	2	JERSEY CITY, N. J.	1
CAMBRIDGE, MASS.	2	AUSTIN, TEX.	1
CARBONDALE, PA.	1		

NUMBER OF SETS 27
TOTAL SETS INSTALLED TO JANUARY 1, 1900 327

TOTAL SETS INSTALLED TO DATE 354
TOTAL DAILY CAPACITY . . . . . 226,600,000 Cubic Feet.

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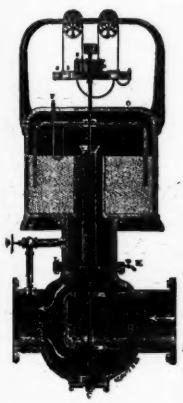

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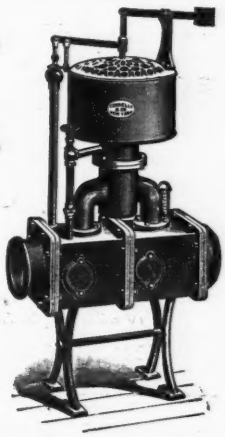

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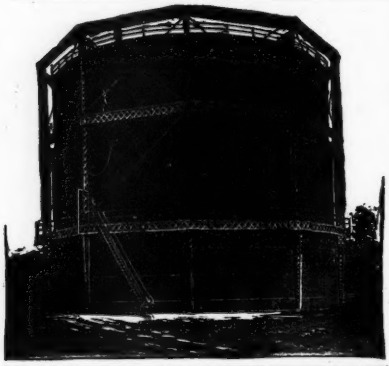

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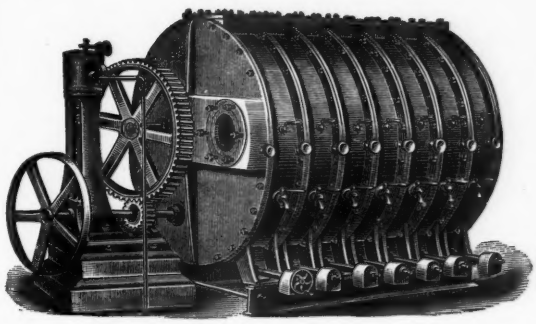

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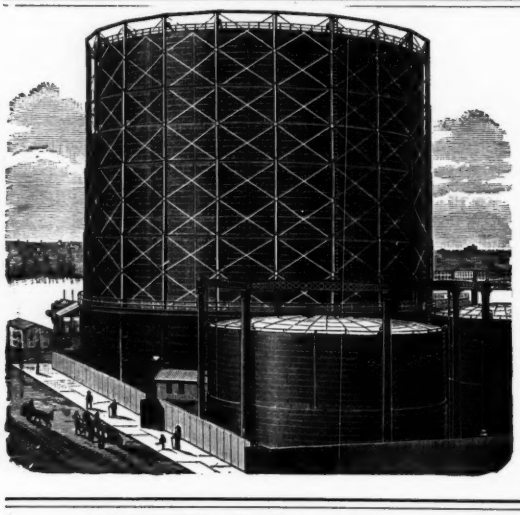

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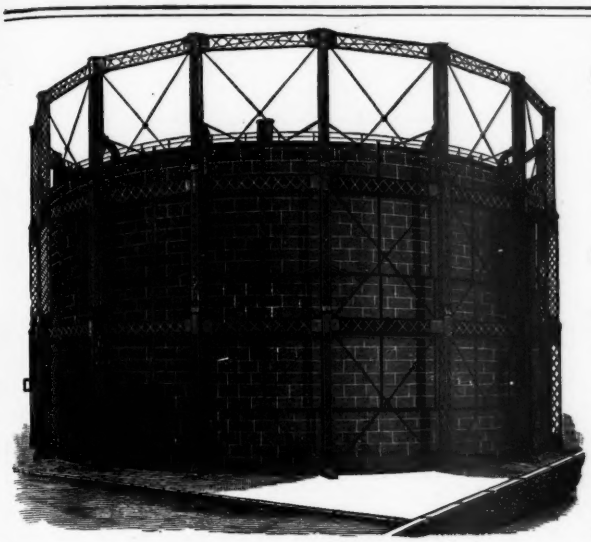

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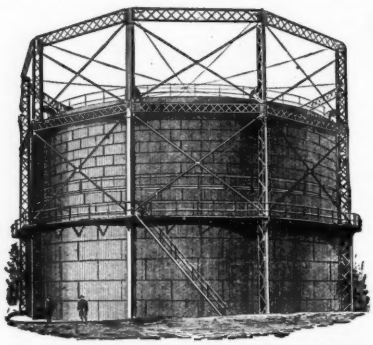

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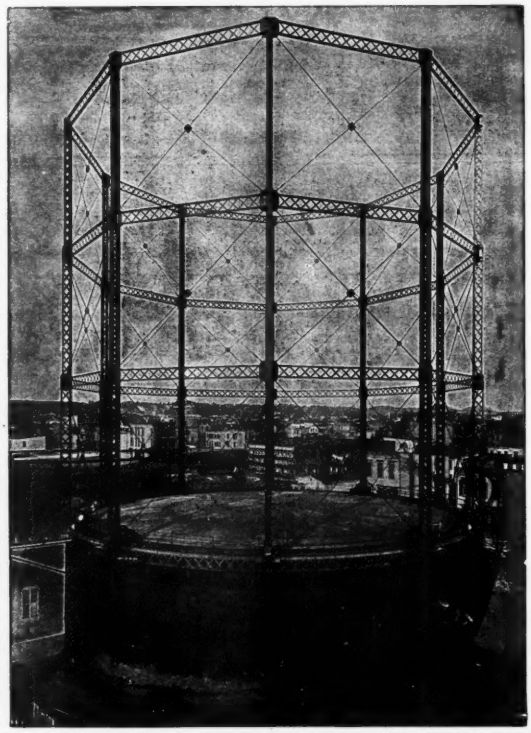

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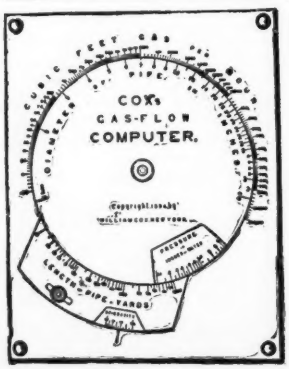

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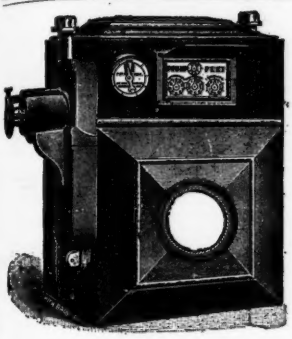

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